Part E

Respiratory Protection

WAC 296-62-071 Respiratory protection.
[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-071, filed 05/04/99, effective 09/01/99. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-071, filed 7/27/81.]

WAC 296-62-07101 To whom does chapter 296-62 WAC, Part E apply? Chapter 296-62 WAC, Part E applies to all employers covered by WISHA. Other requirements for personal protective equipment (PPE) are found in WAC 296-800-160.
[Statutory Authority: RCW 49.17.010, .040, .050. 01-11-038 (Order 99-36), § 296-62-07101, filed 05/09/01, effective 09/09/01. Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07101, filed 05/04/99, effective 09/01/99. [Statutory Authority: RCW 49.17.040 and 49.17.050. 82-08-026 (Order 82-10), § 296-62-07101, filed 3/30/82. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07101, filed 7/27/81.]

Permissible Practice

WAC 296-62-07102 When are you allowed to rely on respirators to protect employees from breathing contaminated air? In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, vapors, or aerosols the goal must be to prevent atmospheric contamination. You must use, if feasible, accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, you must use respirators as required by chapter 296-62 WAC, Part E.
[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07102, filed 05/04/99, effective 09/01/99.]

Employer Responsibilities

WAC 296-62-07103 What are your responsibilities as an employer?

(1) You must provide respirators, when necessary, to protect the health of your employees against recognized respiratory hazards including any exposures in excess of the permissible exposure limit.

(2) You must provide NIOSH-certified respirators that are applicable and suitable for the purpose intended.

(3) You must make sure your employees use respirators when required or when otherwise necessary.

(4) You must establish and maintain a written respiratory protection program that includes the requirements outlined in WAC 296-62-07111.
[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07103, filed 05/04/99, effective 09/01/99.
[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07103, filed 7/27/81.]

Definitions

WAC 296-62-07105 Definitions. The following definitions are important terms used in this part.

Aerosol means a suspension of liquid or solid particles in air.

Air-purifying respirator means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

Assigned protection factor (APF) is the expected level of workplace respiratory protection provided by a properly functioning respirator worn by properly fitted and trained individuals. It describes the ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator.

Atmosphere-supplying respirator means a respirator that supplies the respirator user with breathing air from an uncontaminated source, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA)

units.

Canister or cartridge (air-purifying) means a container with a filter, sorbent, or catalyst, or any combination of these materials, which removes specific contaminants from the air drawn through it.

Canister (oxygen-generating) means a container filled with a chemical that generates oxygen by chemical reaction.

Demand respirator means an atmosphere-supplying respirator that admits breathing air to the facepiece only when suction is created inside the facepiece by inhalation.

Dust means a solid, mechanically-produced particle with sizes varying from submicroscopic to visible. See WAC 296-62-07001(1).

Dusk Mask means a type of filtering facepiece respirator. See the definition for "filtering facepiece."

Emergency situation means any occurrence that may or does result in an uncontrolled significant release of an airborne contaminant. Causes of emergency situations include, but are not limited to, equipment failure, rupture of containers, or failure of control equipment.

Employee exposure means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

End-of-service-life indicator (ESLI) means a system that warns the respirator user of the approach of the end of adequate respiratory protection: For example, that the sorbent is approaching saturation or is no longer effective.

Escape-only respirator means a respirator intended to be used only for emergency exit.

Filter or air-purifying element means a component used in respirators to remove solid or liquid aerosols from the air when it is breathed.

Filtering facepiece (dust mask) means a tight-fitting, half-face, negative pressure, particulate respirator having a facepiece entirely or completely composed of filter material without attached cartridges or canisters.

Fit factor means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio between the measured concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit test means the use of an accepted protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual (see also Qualitative fit test QLFT and Quantitative fit test QNFT).

Fog means a mist of sufficient concentration to perceptibly obscure vision.

Full facepiece means a respirator that covers the wearer's nose, mouth, and eyes.

Fume means a solid condensation particle of extremely small particle size, generally less than one micrometer in diameter. See WAC 296-62-07001(2).

Half facepiece means a respirator that covers the wearer's nose and mouth.

Helmet means the rigid portion of a respirator that also provides protection against impact or penetration.

High-efficiency particulate air filter (HEPA) means a filter that removes from air 99.97% or more of monodisperse dioctyl phthalate (DOP) particles having a mean particle diameter of 0.3 micrometer.

Hood means the portion of a respirator that completely covers the head and neck, may also cover portions of the shoulders and torso.

Immediately dangerous to life or health (IDLH) means an atmosphere that poses an threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Loose-fitting facepiece means a respiratory inlet covering that is designed to form a partial seal with the face.

Mist means a liquid condensation particle with sizes ranging from submicroscopic to visible. See WAC 296-62-07001(4).

Negative pressure respirator means a tight-fitting respirator in which the air pressure inside the facepiece is lower than the ambient air pressure outside the respirator during inhalation.

Nonroutine respirator use means wearing a respirator when carrying out a special task that occurs infrequently.

Odor threshold limit means the lowest concentration of a contaminant in air that can be detected by smell.

Oxygen deficient atmosphere means an atmosphere with an oxygen content below 19.5% by volume.

Particulate means a solid or liquid aerosol such as dust, fog, fume, mist, smoke, or spray.

Permissible exposure limit (PEL) means the legally established time-weighted average (TWA) concentration or ceiling concentration of a contaminant that must not be exceeded.

Physician or other licensed health care professional (PLHCP) means an individual whose legally permitted scope of practice (for example, license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required in WAC 296-62-07150 through 296-62-07156.

Positive-pressure respirator means a respirator in which the air pressure inside the respiratory-inlet covering exceeds the ambient air pressure outside the respirator.

Powered air-purifying respirator (PAPR) means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

Pressure demand respirator means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation or leakage.

Qualitative fit test (QLFT) means a pass/fail fit test that relies on the individual's response to the test agent to assess the adequacy of respirator fit for an individual.

Quantitative fit test (QNFT) means an assessment of the adequacy of respirator fit for an individual by numerically measuring the amount of leakage into the respirator.

Respirable means air that is suitable for breathing.

Respirator means a device, which may or may not be certified by NIOSH, designed to protect the wearer from breathing harmful atmospheres.

WAC 296-62-07105 (Cont.)

Respiratory-inlet covering means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or mouthpiece respirator with nose clamp.

Self-contained breathing apparatus (SCBA) means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Service life means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer. For example, the period of time that an air-purifying device is effective for removing a harmful substance from air when it is breathed.

Smoke means a system that includes the products of combustion, pyrolysis, or chemical reaction of substances in the form of visible and invisible solid and liquid particles and gaseous products in air. Smoke is usually of sufficient concentration to perceptibly obscure vision.

Sorbent is the material contained in a cartridge or canister that removes gases and vapors from the inhaled air.

Spray means a liquid, mechanically-produced particle with sizes generally in the visible.

Supplied-air respirator (SAR) or airline respirator means an atmosphere-supplying respirator for which the source of breathing air is drawn from a separate, stationary system or an uncontaminated environment.

Tight-fitting facepiece means a respiratory inlet covering that forms a complete seal with the face.

Time-weighted average (TWA) means the average concentration of a contaminant in air during a specific time period.

User seal check means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

Valve (air or oxygen) means a device that controls the pressure, direction, or rate of flow of air or oxygen.

Window indicator means a device on a cartridge or canister that visually denotes the service life of the cartridge or canister.

You means the employer or the employer's designee except in WAC 296-62-07117(2) "Important Information About Voluntary Use of Respirators" when you refers to the employee.

Your refers to the employer or the employer's designee except in WAC 296-62-07117(2) "Important Information About Voluntary Use of Respirators" when your refers to the employee.

[Statutory Authority: RCW 49.17.010, .040, .050. 00-21-100 (Order 00-06) § 296-62-07105, filed 10/18/00, effective 01/01/01. Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07105, filed 05/04/99, effective 09/01/99. [Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-07105, filed 1/18/95, effective 3/1/95; 94-15-096 (Order 94-07), § 296-62-07105, filed 7/20/94, effective 9/20/94; 93-19-142 (Order 93-04), § 296-62-07105, filed 9/22/93, effective 11/1/93; 91-24-017 (Order 91-07), § 296-62-07105, filed 11/22/91, effective 12/24/91. RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07105, filed 7/27/81.]

Respiratory Protection Program

WAC 296-62-07107 When is a respiratory protection program required?

(1) In any workplace where respirators are necessary to protect the health of the employee or whenever you require respirator use, you must develop and implement a written respiratory protection program with worksite-specific procedures and specifications for required respirator use.

(2) Upon request, you must provide the director's representative a copy of your written respiratory protection program.

Note: OSHA's Small Entity Compliance Guide contains criteria for the selection of a program administrator and a sample program that meets the requirements of this paragraph. Copies of the Small Entity Compliance Guide will be available from the Occupational Safety and Health Administration's Office of Publications, Room N 3101, 200 Constitution Avenue, NW, Washington, DC, 20210.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07107, filed 05/04/99, effective 09/01/99. [Statutory Authority: Chapters 49.17 RCW. 90-09-026 (Order 90-01), § 296-62-07107, filed 4/10/90, effective 5/25/90.] [Statutory Authority: RCW 49.17.040 and 49.17.050. 82-03-023 (Order 82-1), § 296-62-07107, filed 1/15/82.] [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07107, filed 7/27/81.]

WAC 296-62-07109 When must you update your written respiratory protection program? The program must be updated as necessary to reflect those changes in workplace conditions that may affect respirator use.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07109, filed 05/04/99, effective 09/01/99.] [Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-62-07109, filed 6/11/82; 82-03-023 (Order 82-1), § 296-62-07109, filed 1/15/82.] [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07109, filed 7/27/81.]

WAC 296-62-07111 What must be included in your written respiratory protection program? Include the following provision in your written program, as applicable:

- Procedures for selecting respirators for use in the workplace and a list identifying the proper type of respirator for each respiratory hazard (see WAC 296-62-07130 through 296-62-07133);
- Medical evaluations of employees required to use respirators (see WAC 296-62-07150 through 296-62-07156);
- Fit testing procedures for tight-fitting respirators (see WAC 296-62-07160 through 296-62-07162, and WAC 296-62-07201 through 296-62-07248, Appendices A-1, A-2, and A-3);
- Procedures for proper use of respirators in routine tasks, nonroutine tasks, reasonably foreseeable emergency and rescue situations (see WAC 296-62-07170 through 296-62-07172);
- Procedures for issuing the proper type of respirator based on the respiratory hazards for each employee;
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators (see WAC 296-62-07175 through 296-62-07179 and WAC 296-62-07253);
- Procedures to make sure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators (see WAC 296-62-07182);
- Training of employees in the respiratory hazards to which they are potentially exposed during routine, nonroutine, and unforeseeable emergency and rescue situations (see WAC 296-62-07188);
- Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance (see WAC 296-62-07188); and
- Procedures for regularly evaluating the effectiveness of the program (see WAC 296-62-07192).

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07111, filed 05/04/99, effective 09/01/99. [Statutory Authority: RCW 49.19.040, 49.17.,050 and 49.17.240. 81-16-016 (Order 81-19) § 296-62-07111, filed 7/27/81.]

WAC 296-62-07113 What are the requirements for a program administrator?

You must designate a program administrator qualified by training or experience appropriate to the needs of your program to:

- Oversee the respiratory protection program; and
- Conduct the required evaluations of program effectiveness.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07113, filed 05/04/99, effective 09/01/99.] [Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-19-014, § 296-62-07113, filed 9/5/97, effective 11/5/97.] [Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-62-07113, filed 11/22/91, effective 12/24/91; 88-14-108 (Order 88-11), § 296-62-07113, filed 7/6/88. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07113, filed 7/27/81.]

WAC 296-62-07115 Who pays for the respirators, training, medical evaluations, and fit testing?

When respirators are required, you must provide respirators, training, medical evaluations, and fit testing at no cost to your employees (including expenses such as wages and travel). For voluntary use, see WAC 296-62-07117(3).

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07115, filed 05/04/99, effective 09/01/99.] [Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-07115, filed 7/6/88.] [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-07115, filed 11/30/83; 82-08-026 (Order 82-10), § 296-62-07115, filed 3/30/82. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07115, filed 7/27/81.]

Voluntary Use Of Respirators

WAC 296-62-07117 What must you do when employees choose to wear respirators when respirators are not required?

(1) You may provide respirators at the request of employees or permit employees to use their own respirators, if you determine that such respirator use will not in itself create a hazard.

(2) If you determine that any voluntary respirator use is permissible, you must provide the respirator users with the following information:

Figure 1 Important Information About Voluntary Use of Respirators

*Note: **"You"** and **"your"** mean the employee in the following information.*

Respirators protect against airborne contaminants when properly selected and worn. Respirator use is encouraged, even when exposure to contaminants are below the exposure limit(s), to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to you. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous contaminants (chemical & biological) does not exceed the limits set by WISHA standards. If your employer provides respirators for your voluntary use, or if you are allowed to provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and follow all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against solvent vapor or smoke (since smoke particles are much smaller than dust particles).
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

Spanish version

Ilustración 1 información importante sobre el uso voluntario de respiradores

*Nota: " **Usted** " y " **su** " en la información siguiente se refiere al empleado.*

Los respiradores protegen contra contaminantes aerotransportados cuando son seleccionados y usados correctamente. Para proporcionar un nivel adicional de comodidad y de protección para los trabajadores, el uso del respirador es recomendado, incluso cuando las exposiciones a los contaminantes están bajo del limite de exposición. Sin embargo, si un respirador se utiliza incorrectamente o no se mantiene limpio, el respirador en sí mismo puede convertirse en un peligro para usted. A veces, los trabajadores pueden usar respiradores para evitar exposiciones a los peligros, incluso si la cantidad de contaminantes peligrosos (químicos y biológicos) no exceden los límites mandados por las reglas de WISHA. Si su patrón le proporciona los respiradores para el uso voluntario, o si se le permite proporcionar su propio respirador, usted necesita tomar ciertas precauciones para asegurarse que el respirador en sí mismo no presente un peligro.

Usted debe de hacer lo siguiente:

1. Lea y siga todas las instrucciones proporcionadas por el fabricante en el uso, mantenimiento, limpieza, cuidado, y advertencias con respecto a las limitaciones de los respiradores.
2. Elija los respiradores certificados que le protejan contra el contaminante que está usando. NIOSH, (siglas en Inglés) Instituto Nacional para la Seguridad y Salud Ocupacional del Departamento de la Salud y Servicios Humanos de los Estados Unidos, certifica los respiradores. Una etiqueta o una declaración de la certificación debe aparecer en el respirador o en el empaquetado con el del respirador. La etiqueta o declaración le explicará para lo que fue diseñado el respirador y cuánta protección le ofrece.
3. No use el respirador en atmósferas que contenegan contaminantes para los cuales su respirador no fue diseñado. Por ejemplo, un respirador diseñado para filtrar partículas de polvo no le protegerá contra vapores o humo (ya que las partículas del humo son mucho más pequeñas que partículas de polvo).
4. Marque su respirador de una forma para que usted no utilice equivocadamente el respirador de otra persona.

(3) No respiratory program is required when filtering-facepiece respirators are the only respirator used and they are used voluntarily. When any other type of respirator is used voluntarily, you must establish, implement, and pay for a written program that covers:

- Medical evaluations.
- Cleaning, storage and maintenance related program elements.

[Statutory Authority: RCW 49.17.010, .040, .050. 0021-100 (Order 00-06), § 296-62-07117, filed 10/18/00, effective 01/01/01. Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07117, filed 05/04/99, effective 09/01/99.]
[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07117, filed 7/27/81.]

Respirator Selection

WAC 296-62-07130 What must be considered when selecting any respirator?

(1) You must identify and evaluate the respiratory hazard(s) in the workplace. This evaluation must reasonably estimate employee exposures to respiratory hazard(s) and identify the contaminant's chemical state and physical form. Where you cannot identify or reasonably estimate the employee exposure, you must consider the atmosphere to be IDLH.

(2) You must identify relevant factors pertaining to the workplace and respirator user that affect respirator performance and reliability.

(3) You must select and provide the appropriate respirators based on the respiratory hazards and the relevant factors related to the workplace and user.

(4) You must select a NIOSH-certified respirator. The respirator must be used in compliance with the conditions of its certification.

(5) You must select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07130, filed 05/04/99, effective 09/01/99.

WAC 296-62-07131 What else must you consider when selecting a respirator for use in atmospheres that are not IDLH?

(1) You must provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other WISHA statutory and regulatory requirements for routine, nonroutine, and reasonably foreseeable emergency and rescue situations.

(2) You must use the assigned protection factors (APFs) in Table 1 when selecting respirators.

Note: The APF values listed in Table 1 do not apply when respirator selection is specified by other applicable standards (e.g., asbestos, lead standards in chapter 296-62 WAC).

Table 1--Assigned Protection Factors

Type of Respirator	**Assigned Protection Factor**[a]
Air-Purifying Respirators (APRs)	
Half-facepiece[b] for: • Particulate-filter • Vapor- or gas-removing • Combination particulate-filter and vapor- or gas-removing	10
Full facepiece for: • Particulate-filter; • Vapor- or gas-removing; • Combination particulate-filter and vapor- or gas-removing	100
Powered Air-Purifying Respirators (PAPRs)	
Powered air-purifying, loose fitting facepiece	25
Powered air-purifying , half facepiece	50
Powered air-purifying, full facepiece, equipped with HEPA filters or sorbent cartridges or canisters	1000
Powered air-purifying, hood or helmet equipped with HEPA filters or sorbent cartridges or canisters.	1000
Supplied-Air (Airline) Respirators	
Supplied-air, demand, half facepiece	10
Supplied-air, continuous-flow, loose fitting facepiece	25
Supplied-air, continuous-flow or pressure-demand type, half facepiece	50
Supplied-air, demand, full facepiece	100
Supplied-air, continuous-flow or pressure-demand type, full facepiece	1000
Supplied-air, continuous-flow, helmet or hood	1000
Self-Contained Breathing Apparatus (SCBAs)	
Self-contained breathing apparatus, demand-type, half facepiece[b]	10
Self-contained breathing apparatus, demand-type, full facepiece	100
Self-contained breathing apparatus, pressure-demand type, full facepiece	10,000

Combination respirators. For combination respirators (such as, airline respirators with an air-purifying filter), the type and mode of operation having the lowest respirator protection factor must be applied to the combination respirator not listed.

[a] An assigned protection factor (APF) is a numeric rating given to respirators, which tells how much protection the respirator can provide. Multiplying the WISHA permissible exposure limit (PEL) for a contaminant by the respirator APF gives the maximum concentration of the contaminant for which the respirator can be used. PEL values can be found in chapter 296-62 WAC, Part H.

[b] If the air contaminant causes eye irritation, the wearer of a respirator equipped with a quarter-mask or half-mask facepiece or mouthpiece and nose clamp must be permitted to use a protective goggle or to use a respirator equipped with a full facepiece. Mouthpiece and nose clamp respirators are approved by NIOSH only for escape from IDLH atmospheres.

WAC 296-62-07131 (Cont.)

(3) The respirator selected must be apropriate for the chemical state and physical form of the contaminant.

(4) For protection against gases and vpors, you must provide an atmosphere-supplying respirator or an air-purifying respirator, provided that:

- The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or
- If there is no ESLI appropriate for the conditions in your workplace, you must implement a change schedule for canisters and cartridges that is based on objective information or data that will make sure that canisters and cartridges are changed before the end of their service life. Your respirator program must describe:
  - The information and data relied upon; and
  - The basis for the canister and cartridge change schedule; and
  - The basis for reliance on the data.

(5) For protection against particulates, you must provide:

- An atmosphere-supplying respirator; or
- An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR Part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR Part 84; or
- An air-purifying respirator equipped with any filter certified for particulates by NIOSH for contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers; or
- For filters to be changed as required in WAC 296-62-07171(4).

[Statutory Authority: RCW 49.17.010, .040, .050. 00-21-100 (Order 00-06), § 296-62-07131, filed 10/18/00, effective 01/01/01. Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07131, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07132 What else must you consider when selecting a respirator for use in IDLH atmospheres?

(1) You must provide the following respirators for your employees to use in IDLH atmospheres:

- A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes; or
- A combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.

(2) Respirators provided only for escape from IDLH atmospheres must be NIOSH-certified for escape from the atmosphere in which they will be used.

(3) All oxygen-deficient atmospheres must be considered IDLH unless you demonstrate that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table 2 of this section (i.e., for the altitudes set out in the table). In such cases, any atmosphere-supplying respirator may be used.

Table 2 Altitudes for Oxygen Deficient Atmospheres

Altitude (ft.)	Oxygen deficient atmospheres ($\%O_2$) for which the employer may rely on any atmosphere-supplying respirator
Less than 3,001	16.0 - 19.5
3,001 - 4,000	16.4 - 19.5
4,001 - 5,000	17.1 - 19.5
5,001 - 6,000	17.8 - 19.5
6,001 - 8,000	19.3 - 19.5

[1]Above 8,000 feet the exception does not apply. Oxygen-enriched breathing air must be supplied above 14,000 feet. [Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07132, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07133 What else must you consider when selecting a respirator for emergency and rescue use?

(1) You must analyze emergency and rescue uses of respirators that may occur in each operation by carefully considering materials, equipment, processes, and personnel involved in each operation. The person who is thoroughly familiar with the particular operation must review the analysis. As part of your analysis, you must:

- Consider past occurrences requiring emergency or rescue use of respirators as well as conditions that resulted in such respirator applications;
- Consider the possible consequences of equipment or power failures, uncontrolled chemical reactions, fire, explosion, or human error; and
- Based on the above considerations, list potential hazards that may result in emergency or rescue use of respirators.

(2) Based upon the analysis, you must:

- Select the appropriate types of respirators;
- Provide an adequate number of respirators for each area where they may be needed for emergency or rescue use; and
- Maintain and store the respirators so that they are readily accessible and operational when needed. [Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07133, filed 05/04/99, effective 09/01/99.]

Medical Evaluations

WAC 296-62-07150 What are the general requirements for medical evaluations? Before an employee is fit tested or required to use a respirator in the workplace, you must provide a medical evaluation to determine the employee's ability to use a respirator. Medical evaluations are not required:

- When the only respirators used are filtering facepiece respirators that are used voluntarily under WAC 296-62-07117; or
- When the only respirators used are loose fitting escape-only respirators.

WAC 296-62-07150 (Cont.)

You may rely upon a previous employer's medical evaluation, if you can show that:

- You have been provided with a copy of the written recommendation as required in WAC 296-62-07155 from the PLHCP approving the employee to use the respirator chosen; and
- The previous working conditions, which required respirator use as detailed in WAC 296-62-07154(1), are substantially similar to yours.

Steps necessary for completing a medical evaluation:

- You identify a PLHCP (WAC 296-62-07151);
- You provide information to the PLHCP (WAC 296-62-07152);
- PLHCP reviews information and determines what additional questions, if any, to add to Part A of the questionnaire (WAC 296-62-07153(2));
- You administer the questionnaire confidentially (WAC 296-62-07153 (3) and (4));
- PLHCP reviews and evaluates the questionnaire (WAC 296-62-07154(1));
- PLHCP completes any follow-up medical evaluations with employees (WAC 296-62-07154 (2) and (3));
- PLHCP completes the written recommendation and sends it to the employee and you (WAC 296-62-07155 (1) and (2));
- You respond appropriately to written recommendations (WAC 296-62-07155(2)) and maintain records (WAC 296-62-07194);
- You provide additional medical evaluations when required by your PLHCP (WAC 296-62-07156).

[Statutory Authority: RCW 49.17.010, .040, .050. 00-21-100 (Order 00-06), § 296-62-07150, filed 10/18/00, effective 01/01/01. Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07150, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07151 Who must perform medical evaluations? You must identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07151, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07152 What information must you provide to the PLHCP in addition to the questionnaire? You must provide the following information to the PLHCP before the PLHCP makes a recommendation concerning an employee's ability to use a respirator:

- The questionnaire found in WAC 296-62-07255, Appendix C;
- The type and weight of the respirator to be used by the employee;
- The duration and frequency of respirator use (including use for rescue and escape);
- The expected physical work effort;
- Additional protective clothing and equipment to be worn;
- Temperature and humidity extremes that may be encountered;
- A copy of your written respiratory protection program (including, but not limited to, a list of respirators as required in WAC 296-62-07111(1) and fit testing procedures as required in WAC 296-62-07111(3)); and
- A copy of chapter 296-62 WAC, Part E, Respiratory protection.

When an employee needs a subsequent medical evaluation, you do not have to provide any information previously given to the PLHCP if the information and the PLHCP remain the same.

Note: When you change your PLHCP, you must make sure that the new PLHCP obtains this information, either by providing the documents directly to the PLHCP or having the documents transferred from the former PLHCP to the new PLHCP. WISHA does not expect you to have employees medically reevaluated solely because a new PLHCP has been selected.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07152, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07153 How must the medical evaluations and the questionnaire be administered?

(1) An initial evaluation must be completed. You may use the questionnaire in WAC 296-62-07255. It is not necessary to have an initial medical examination. However, an initial medical examination may be substituted for the questionnaire if it obtains the same information. Questions in Section 1 and 2 of Part A must be answered by all respirator users, while questions in Section 3 must be answered by SCBA and full facepiece respirator users. The PLHCP determines what additional questions must be used in the questionnaire from Part B in WAC 296-62-07255.

(2) The medical questionnaire and examinations must be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee.

Confidentiality. The medical questionnaire must be administered in a way that makes sure that the employee understands its content. To ensure confidentiality, you must not review an employee's questionnaire at any time. This includes looking at the completed questions or any other interaction that may be considered a breach of confidentiality.

The following are different options that may be used to administer questionnaires confidentially:

- You may administer the questionnaire and arrange for employee access to a PLHCP if there are any questions. For example, you may provide employees a copy of the questionnaire, ask them to fill it out, and place it in a sealed envelope that is sent to the PLHCP.
- Your PLHCP may administer the questionnaire.
- You may hire a third party to confidentially administer the questionnaire.

(3) You must provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07153, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07154 Who must review the questionnaire and determine what, if any, follow-up evaluations are needed?

You must provide for the following PLHCP evaluations.

- For the initial medical evaluation, the PLHCP must review the information obtained by the questionnaire in WAC 296-62-07255.
- The PLHCP must provide a follow-up medical evaluation for any employee who gives a positive response to any one of questions 1 through 8 in Section 2 of Part A in WAC 296-62-07255 or whose initial medical evaluation demonstrates the need for follow-up evaluation.
- The follow-up medical evaluation must include any consultations (for example, a telephone conversation to evaluate positive responses on the questionnaire), medical tests, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

Note: When you replace a PLHCP, you must make sure that the new PLHCP obtains this information, either by providing the documents directly to the PLHCP or having the documents transferred from the former PLHCP to the new PLHCP. However, WISHA does not expect you to have employees medically reevaluated solely because a new PLHCP has been selected.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07154, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07155 What must be included in the PLHCP's written recommendation?

(1) In determining the employee's ability to use a respirator, you must obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. The recommendation must provide only the following information about the employee:

- Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator;

- The need, if any, for periodic future medical evaluations; and
- A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

(2) You must provide a PAPR, if:

- The respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the employee's health at increased risk if the respirator is used;
- The PLHCP's medical evaluation finds that the employee can use such a respirator. You no longer must provide a PAPR, if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure.

[Statutory Authority: RCW 49.17.010, .040, .050. 00-21-100 (Order 00-06), § 296-62-07155, filed 10/18/00, effective 01/01/01. Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07155, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07156 When are future medical evaluations required? At a minimum, you must provide future medical evaluations that comply with the requirements in WAC 296-62-07151 through 296-62-07155 if:

- A PLHCP recommends that an employee be reevaluated at a set interval;
- An employee reports medical signs or symptoms related to his or her ability to use a respirator;
- A supervisor, or the respirator program administrator informs you that an employee needs to be reevaluated;
- Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation; or
- A change occurs in workplace conditions (for example, physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

You may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.

[Statutory Authority: RCW 49.17.010, .040, .050. 00-21-100 (Order 00-06), § 296-62-07156, filed 10/18/00, effective 01/01/01. Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07156, filed 05/04/99, effective 09/01/99.]

Fit Testing

WAC 296-62-07160 When is fit testing required? You must make sure that employees using a negative or positive pressure tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT). Fit testing must occur:

- Prior to initial use of the respirator;
- Whenever a different respirator facepiece (size, style, model or make) is used;
- At least annually thereafter; and
- Whenever the employee reports to you or your PLHCP observes changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

You may rely on a current fit test completed by a previous employer for the same employee if you obtain written documentation of the fit test and all other applicable requirements in WAC 296-62-07160 through 296-62-07162 have been satisfied.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07160, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07161 What is required when an employee finds the respirator's fit unacceptable? If after passing a qualitative fit test or a quantitative fit test, your employee subsequently notifies you or your PLHCP that the fit of the respirator is unacceptable, you must give the employee a reasonable opportunity to select a different respirator facepiece and to be retested.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07161, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07162 How must fit testing be done?

(1) The fit test must be administered using WISHA-accepted quantitative or qualitative protocol. These protocols are contained in WAC 296-62-07201 through 296-62-07248 (Appendices A-1, A-2 and A-3 of this part).

(2) Qualitative fit testing may be used to fit test negative pressure air-purifying respirators only when they will be used in atmospheres where the concentration is less than 10 times the PEL. For negative pressure respirator use in concentrations equal to or greater than 10 times the PEL, quantitative fit testing must be used.

(3) If the fit factor, as determined through WISHA-accepted quantitative fit testing protocol, is equal to or greater than 100 for tight-fitting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the employee passed the quantitative fit test for that respirator.

(4) Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators must be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

(a) Qualitative fit testing of these respirators must be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.

(b) Quantitative fit testing of these respirators must be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement must be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.

(c) Any modifications to the respirator facepiece for fit testing must be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.

[Statutory Authority: RCW 49.17.010, .040, .050. 00-21-100 (Order 00-06), § 296-62-07162, filed 10/18/00/ effective 01/01/01. Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07162, filed 05/04/99, effective 09/01/99.]

Use Of Respirators

WAC 296-62-07170 How must you prevent problems with the seal on tight-fitting facepieces?

(1) You must not permit respirators with tight-fitting facepieces to be worn during fit testing and respirator use by employees who have:

- Any facial hair that is visibly projecting above the skin (stubble, moustache, sideburns, portions of a beard, low hairline, bangs) that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or
- Any other condition that interferes with the face-to-facepiece seal or valve function.

(2) If an employee wears corrective glasses or goggles or other personal protective equipment, you must make sure that such equipment is worn in a manner that does not interfere with the seal of the facepiece.

(3) For all tight-fitting respirators, you must make sure that employees perform a user seal check each time they put on the respirator using the procedures in Appendix B-1 or procedures recommended by the respirator manufacturer that you demonstrate are as effective as those in Appendix B-1 of chapter 296-62 WAC, Part E.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07170, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07171 How do you monitor continuing effectiveness of your employees' respirators?

(1) You must maintain appropriate surveillance of work area conditions and degree of employee exposure or stress.

(2) When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, you must reevaluate the continued effectiveness of the respirator.

(3) You must make sure that employees leave the respirator use area:

- To wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use; or
- If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece; or
- To replace the respirator or the filter, cartridge, or canister elements; or
- If the employee experiences severe discomfort in wearing the respirator; or
- If the employee becomes ill or experiences sensations of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, and chills.

(4) If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece, you must replace or repair the respirator before allowing the employee to return to the work area.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07171, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07172 What are the standby procedures when respirators are used in IDLH situations?

(1) You must provide standby employees when employees are working in IDLH atmospheres.

In certain IDLH situations, one standby employee is permitted when the IDLH atmosphere is well characterized and you can show that one employee can adequately:

- Monitor the employee(s) in the IDLH atmosphere;
- Implement communication activities; and
- Initiate rescue duties.

For all other IDLH situations, you must have at least two employees located outside the IDLH atmosphere.

(2) Visual, voice, or signal line communication must be maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere.

(3) The employee(s) located outside the IDLH atmosphere must be trained and equipped to provide effective emergency rescue.

(4) You or your designee must be notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue.

(5) You or your designee, once notified, must provide necessary assistance appropriate to the situation.

(6) Standby employee(s) located outside the IDLH atmospheres must be equipped with:

(a) Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either

(b) Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or equivalent means for rescue where retrieval equipment is not required.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07172, filed 05/04/99, effective 09/01/99.]

Maintenance and Care of Respirators

WAC 296-62-07175 How must respirators be cleaned and disinfected?

(1) You must provide each respirator user with a respirator that is clean, sanitary, and in good working order.

(2) You must make sure that respirators are cleaned and disinfected using the procedures in WAC 296-62-07253, Appendix B-2, or procedures recommended by the respirator manufacturer, provided that such procedures are as effective.

(3) The respirators must be cleaned and disinfected as follows:

- Respirators issued for the exclusive use of an employee must be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;
- Respirators issued to more than one employee must be cleaned and disinfected before being worn by different individuals;
- Respirators maintained for emergency use must be cleaned and disinfected after each use, and
- Respirators used in fit testing and training must be cleaned and disinfected before being worn by a different employee.

[Statutory Authority: RCW 49.17.010, 0.40, .050. 99-10 (Order 98-10) § 296-62-07175, filed o5/04/99, effective 09/01/99.]

WAC 296-62-07176 How must respirators be stored?

(1) You must make sure that all respirators are stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals. You must also make sure that they are packed or stored to prevent deformation of the facepiece and exhalation valve.

(2) When storing emergency respirators.

(a) You must keep respirators accessible to the work area.

(b) You must store respirators in compartments or in covers that are clearly marked as containing emergency respirators.

(c) You must store respirators in accordance with any applicable manufacturer instructions.

(d) You must provide an adequate number of respirators for each work area where they may be needed.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07176, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07177 When must respirators be inspected? You must make sure that:

- All respirators used in routine situations are inspected before each use and during cleaning;
- All respirators maintained for use in emergency situations are inspected at least monthly and in accordance with the manufacturer's recommendations, and are checked for proper function before and after each use;
- Emergency escape-only respirators are inspected before being carried into the workplace for use; and
- Self-contained breathing apparatus (SCBAs) must be inspected monthly.

[Statutory Authority: RCW 49.17.010, .0450, .050. 99-10 (Order 98-10) § 296-62-07177, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07178 How must respirators be inspected and maintained?

(1) You must make sure that respirator inspections include:

- A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters; and
- A check of elastomeric parts for pliability and signs of deterioration.

(2) For self-contained breathing apparatus you must:

- Maintain air and oxygen cylinders in a fully charged state and recharge the cylinders when the pressure falls to 90% of the manufacturer's recommended pressure level; and
- Determine that the regulator and warning devices function properly.

(3) For respirators maintained for emergency use, you must:

- Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator; and
- Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports compartment for the electronic files. This information must be maintained until replaced following a subsequent certification.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 99-10), § 296-62-07178, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07179 How must respirators be repaired and adjusted?

(1) You must make sure that respirators that fail an inspection or are otherwise found to be defective are no longer used until they are repaired or adjusted properly;

(2) Repairs or adjustments to respirators must be made only by persons appropriately trained to perform such operations, who must use only the respirator manufacturer's NIOSH-approved parts designed for the respirator;

(3) Repairs must be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and

(4) Reducing and admission valves, regulators, and alarms must be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07179, filed 05/04/99, effective 09/01/99.]

Breathing Air Quality

WAC 296-62-07182 What are the breathing gas requirements for atmosphere-supplying respirators?

(1) You must provide employees using atmosphere-supplying respirators (supplied-air and SCBA) with breathing gases of high purity.

(2) You must make sure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

- Compressed and liquid oxygen must meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and

- Compressed breathing air must meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
  - Oxygen content (v/v) of 19.5-23.5%;
  - Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
  - Carbon monoxide (CO) content of 10 ppm or less;
  - Carbon dioxide content of 1,000 ppm or less; and
  - Lack of noticeable odor.

(3) You must make sure that compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.

(4) You must make sure that oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.

(5) Cylinders used to supply breathing air to respirators.

(a) Cylinders must be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR Part 173 and Part 178);

(b) Cylinders of purchased breathing air must have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air; and

(c) The moisture content in the cylinder must not exceed a dew point of -50. ° F (-45.6°C) at 1 atmosphere pressure.

(6) Compressors used to supply breathing air to respirators.

(a) Compressors must be constructed and situated so as to prevent entry of contaminated air into the air-supply system.

(b) Compressors must minimize moisture content so that the dew point at 1 atmosphere pressure is 10°F (5.56C) below the ambient temperature.

(c) Compressors must have suitable in-line air-purifying sorbent beds and filters to further make sure that the supplied-air is breathing air quality. Sorbent beds and filters must be maintained and replaced or refurbished periodically following the manufacturer's instructions.

(d) Compressors must have a tag containing the most recent sorbent bed and filter change date and the signature of the person authorized by the employer to perform the change. The tag must be maintained at the compressor.

(7) For compressors that are not oil-lubricated, you must make sure that carbon monoxide levels in the breathing air do not exceed 10 ppm.

(8) For oil-lubricated compressors, you must use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply must be monitored at intervals sufficient to make sure the concentration of carbon monoxide in the breathing air does not exceed 10 ppm.

(9) You must make sure that breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. Asphyxiating substances must not be introduced into breathing air lines.

(10) You must use breathing gas containers marked in accordance with the NIOSH respirator certification standard, 42 CFR Part 84.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07182, filed 05/04/99, effective 09/01/99.]

Identification Of Filters, Cartridges And Canisters

WAC 296-62-07184 How must filters, cartridges and canisters be labeled? You must make sure that all filters, cartridges and canisters used in the workplace are labeled and color coded with the NIOSH approval label. The label must not be removed and must remain legible. Table 3 provides information about color coding for air-purifying respirator filters, cartridges, and canisters.

TABLE 3 -- Color Coding of Respirator Filters, Cartridges and Canisters

Atmospheric Contaminants to be Protected Against	Colors Assigned.*
Acid gases	White.
Hydrocyanic acid gas	White with 1/2 - inch green stripe completely around the canister near the bottom.
Chlorine gas	White with 1/2 - inch yellow stripe completely around the canister near the bottom.
Organic vapors	Black.
Ammonia gas	Green.
Acid gases and ammonia gas	Green with 1/2 - inch white stripe completely around the canister near the bottom.
Carbon monoxide	Blue.
Acid gases and organic vapors	Yellow.
Hydrocyanic acid gas and chloropicrin vapor	Yellow with 1/2 - inch blue stripe completely around the canister near the bottom.
Acid gases, organic vapors, and ammonia gases	Brown.
Radioactive materials, excepting tritium and noble gases	Purple (Magenta).
Particulates (dusts, fumes, mists, fogs, or smokes) in combination with any of the above cases or vapors	Canister color for contaminant, as designated above, with 1/2 - inch gray stripe completely around the canister near the top.
All of the above atmospheric contaminants	Red with 1/2 - inch gray stripe completely around the canister near the top.

*Gray must not be assigned as the main color for a canister designed to remove acids or vapors. Note: Orange must be used as a complete body, or stripe color to represent gases not included in this table. The user will need to refer to the canister label to determine the degree of protection the canister will afford.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07184, filed 05/04/99, effective 09/01/99.]

Training and Information

WAC 296-62-07186 What are the general training requirements?

(1) You must provide effective training to:

- Employees required to use respirators;
- Supervisors; and
- Any person issuing respirators.

(2) The training must be done so your employees understand it.

(3) The training must be provided by qualified persons.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07186, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07188 How do you know if you adequately trained your employees? At a minimum, you must make certain that each employee can demonstrate:

- Why the respirator is necessary and how improper fit, use, or maintenance can compromise the protective effect of the respirator;
- What the respirator is capable of doing and what its limitations are;
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- How to inspect (see WAC 296-62-07178), put on and remove, use (see WAC 296-62-07170 through 296-62-07172), and check the seals (see WAC 296-62-07251) of the respirator;
- The procedures for maintaining (see WAC 296-62-07175 through 296-62-07179, 296-62-07182(5) and 296-62-07253) and storing (see WAC 296-62-07176) of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
- The general requirements of chapter 296-62 WAC, Part E.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10), § 296-62-07188, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07190 When must your employees be trained?

(1) You must train employees before they are required to use a respirator in the workplace.

(2) If you are able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified in WAC 296-62-07172 and 296-62-07186, then you are not required to repeat the training provided that the employee can demonstrate knowledge of the element(s) required in WAC 296-62-07188.

(3) If you do not repeat initial training for an employee, then you must provide retraining no later than 12 months from the date of the employee's previous training.

(4) Retraining must be completed annually, and when the following situations occur:

- Changes in the workplace or the type of respirator render previous training obsolete or incomplete;
- The employee's knowledge or use of the respirator indicates that the employee has not retained the understanding or skill as required in WAC 296-62-07188 above; or
- Any other situation arises when retraining appears to be necessary to make sure respirators are used safely.

[Statutory Authority: RCW 49.17.010, .040, .050. 00-21-100 (Order 00-06), § 296-62-17190, filed 10/18/00, effective 01/01/01. Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10), § 296-62-07190, filed 05/04/99, effective 09/01/99.]

Program Evaluation

WAC 296-62-07192 How must you evaluate the effectiveness of your respiratory protection program?

(1) You must evaluate the workplace as necessary to make sure that the requirements of the current written program are being effectively carried out and that the program continues to be effective.

(2) Evaluation must include periodic monitoring by the supervisor to make sure respirators are properly worn.

(3) You must regularly ask employees required to use respirators their views on the program's effectiveness and use their input to identify any problems. Any problems identified must be corrected. At a minimum, you must evaluate the following factors:

- Respirator fit (including the employee's ability to use the respirator without interfering with effective workplace performance);
- Appropriate respirator selection for the hazards to which the employee is exposed;
- Proper respirator use under the workplace conditions the employee encounters; and
- Proper respirator maintenance.

(4) Medical and bioassay surveillance. When appropriate, medical surveillance, including bioassays, must be carried out to determine if employees using respirators are receiving adequate respiratory protection. A physician must determine the requirements of the surveillance program.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07192, filed 05/04/99, effective 09/01/99.]

Recordkeeping

WAC 296-62-07194 What are the recordkeeping requirements?

(1) General. You must keep written records of the following:

- Written recommendations from the PLHCP;
- Fit testing;
- The respirator program; and
- Training.

(2) Access to medical records. You must make the written recommendations from the PLHCP and any other medical records you are maintaining available as required by chapter 296-62 WAC, Part B.

(3) Fit testing. You must keep a record of any qualitative and quantitative fit tests completed for each employee. The record must include:

- The name or identification of the employee tested;
- Type of fit test performed;
- Specific make, model, style, and size of respirator tested;
- Date of test; and
- The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.

Fit test records must be retained for respirator users until the next fit test is administered.

(4) You must keep a written copy of the current respirator program.

(5) You must keep written training records that include:

- Names of the employees trained; and
- The dates when the employees were trained.

(6) Written materials required by this part must be made available upon request for examination and copying to affected employees and to the director or the director's designee.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07194, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07201 Appendix A-1: General Fit Testing Requirements for Respiratory Protection--Mandatory. This is a mandatory appendix to chapter 296-62 WAC, Part E, which includes WAC 296-62-07201 through 296-62-07203.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07201, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07202 What are the general requirements for fit testing?

(1) You must conduct fit testing using the procedures found in appendices A-1 through A-3. The requirements in these appendices apply to all WISHA-accepted qualitative (QLFT) and quantitative (QNFT) fit test methods.

(2) You must allow your employees to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

(3) Prior to selecting a respirator, you must show your employees how to:

- Put on a respirator;
- Positioned the respirator on the face;
- Set strap tension; and
- Determine an acceptable fit.

(4) You must provide a mirror for your employees to use when evaluating the fit and positioning of the respirator. This instruction does not constitute your employees' formal training on respirator use, because it is only a review.

(5) You must inform your employees that:

- They are being asked to select the respirator that provides the most acceptable fit;
- Each respirator represents a different size and shape; and
- If fitted and used properly, each respirator will provide adequate protection.

(6) You must have your employees hold each chosen facepiece up to their face and eliminate those that obviously do not give an acceptable fit.

(7) You must note the more acceptable facepieces in case the one selected proves unacceptable. The most comfortable mask must be put on and worn at least five minutes to make sure it is comfortable. You must help your employee assess comfort by discussing the points in subsection (8) of this section. If the employee is not familiar with using a particular respirator, have the employee put on the mask several times and adjust the straps each time to become adept at setting proper tension on the straps.

(8) You must review how to assess the comfort of a respirator by reviewing the following points with the employee and allowing the employee enough time to check the comfort of the respirator chosen:

(a) Position of the mask on the nose;

(b) Room for eye protection;

(c) Room to talk;

(d) Position of mask on face and cheeks.

(9) You must use the following criteria to determine if the respirator adequately fits each employee:

(a) Chin properly placed;

(b) Adequate strap tension, not overly tightened;

(c) Fit across nose bridge;

(d) Respirator of proper size to span distance from nose to chin;

(e) Tendency of respirator to slip;

(f) Self-observation in mirror to evaluate fit and respirator position.

(10) The employees must complete a user seal check. They must use either the negative and positive pressure seal checks described in WAC 296-62-07251, Appendix B-1 or those recommended by the respirator manufacturer that provide equivalent protection to the procedures in WAC 296-62-07251, Appendix B-1. Before conducting the negative and positive pressure checks, the employee must be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece must be selected and retested if the employee's respirator fails the user seal check tests.

(11) You must not conduct the fit test if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns that cross the respirator sealing surface. Any type of apparel that interferes with a satisfactory fit must be altered or removed.

(12) If the employee has difficulty in breathing during the tests, you must refer the employee to a physician or other licensed health care professional, as appropriate, to determine whether the employee can wear respirators while performing the employee's duties.

(13) If the employee finds the fit of the respirator unacceptable, you must give the employee the opportunity to select a different respirator and the employee must be retested.

(14) Prior to starting the fit test, you must describe the:

- Fit test to the employee;
- Employee's responsibilities during the test procedure; and
- Test exercises that the employee will be performing.

(15) The employee must wear the respirator at least 5 minutes before starting the fit test.

(16) When performing the fit test, you must have your employee wear any applicable safety equipment that may be worn during actual respirator use that could interfere with respirator fit.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07202, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07203 What are the fit test exercise requirements?

(1) You must have your employees perform the following test exercises for all fit testing methods required in the appendices for Respiratory Protection Part E, except for the controlled negative pressure (CNP) testing. The CNP protocol contains a different fit testing exercise regimen. The employee must perform exercises, in the test environment, in the following ways:

(a) Normal breathing. In a normal standing position, without talking, the employee must breathe normally.

(b) Deep breathing. In a normal standing position, the employee must breathe slowly and deeply, taking caution so as not to hyperventilate.

(c) Turning head side to side. Standing in place, the employees must slowly turn their heads from side to side between the extreme positions on each side, holding their heads at each extreme momentarily so they can inhale at each side.

(d) Moving head up and down. Standing in place, the employees must slowly move their heads up and down, inhaling in the up position (when looking toward the ceiling).

(e) Talking. The employee must talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The employee can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(f) Grimace. The employee must grimace by smiling or frowning (this applies only to QNFT testing; it is not performed for QLFT).

(g) Bending over. Employees must bend at their waist as if they were touching their toes. Jogging in place must be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

(h) Normal breathing. Repeat exercise (a) for normal breathing.

(2) Each test exercise must be performed for one minute except for the grimace exercise, which must be performed for 15 seconds.

(3) You must question the employee about the comfort of the respirator after completing the test exercises. If the respirator has become unacceptable, you must try another model of respirator.

(4) Any adjustments during fit testing will void the test, making it necessary to begin again.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07203, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07205 Appendix A-2: Qualitative Fit Testing (QLFT) Protocols for Respiratory Protection--Mandatory. This is a mandatory appendix to chapter 296-62 WAC, Part E, which includes WAC 296-62-07205 through 296-62-07225.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07205, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07206 What are the general qualitative fit testing (QLFT) protocols?

(1) You must make sure the person who administers QLFT is able to:

- Prepare test solutions;
- Calibrate equipment and perform tests properly;
- Recognize invalid tests; and
- Make sure that test equipment is in proper working order.

(2) You must make sure that QLFT equipment is kept clean and well maintained so it operates within the parameters for which it was designed.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07206, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07208 Isoamyl acetate protocol (a QLFT).

Note: You must equip particulate respirators with an organic vapor cartridge or canister when using the isoamyl acetate protocol for fit testing.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07208, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07209 What are the odor threshold screening procedures for isoamyl acetate (QLFT)?

(1) Why use odor threshold screening?

Odor threshold screening, performed without wearing a respirator, determines if the employee tested can detect the odor of isoamyl acetate at low levels.

(2) How are the test solutions for odor threshold screening prepared?

(a) Use three 1 liter glass jars with metal lids.

(b) Use odor-free water (for example, distilled or spring water) at approximately 25°C (77°F) for preparing the solutions.

(c) Stock solution: Prepare the isoamyl acetate (IAA) (also known at isopentyl acetate) stock solution by:

- Adding 1 ml of pure IAA to 800 ml of odor-free water in a 1 liter jar;
- Closing the lid; and
- Shaking for 30 seconds.

A new stock solution must be prepared at least weekly.

(d) Daily test solution: Prepare the daily odor test solution in a second jar by placing 0.4 ml of the IAA stock solution into 500 ml of odor-free water using a clean dropper or pipette. Shake the solution for 30 seconds and allow it to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. The daily test solution must be used for only one day.

(e) Prepare a test blank in a third jar by adding 500 cc of odor-free water.

(f) Clearly label and identify the daily odor test solution and test blank jar lids (for example, 1 and 2). Place the labels on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.

(g) Prepare the solutions used in the IAA odor detection test in an area separate from where the test is performed, in order to prevent olfactory (smelling) fatigue in the employee.

(3) What are the odor threshold screening procedures?

(a) Conduct the screening test in a different room from the one used for actual fit testing. The two rooms must be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.

(b) Type the following instructions on a card and place them on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(c) If the employee is unable to correctly identify the jar containing the odor test solution, do not perform the IAA qualitative fit test.

(d) If the employee correctly identifies the jar containing the odor test solution, the employee may proceed to respirator selection and fit testing.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07209, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07210 What are the isoamyl acetate fit testing procedures (QLFT)?

(1) The fit test chamber must be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the employee's head. If no drum liner is available, construct a similar chamber using plastic sheeting.

(2) Attach a small hook to the inside top center of the chamber.

(3) Equip each respirator used for the fitting and fit testing with organic vapor cartridges or offer protection against organic vapors.

(4) After selecting, putting on, and properly adjusting a respirator, the employee must wear it to the fit testing room.

(5) This room used for fit testing must be separate from the room used for odor threshold screening and respirator selection. It must be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(6) A copy of the test exercises and any prepared text from which the employee is to read must be taped to the inside of the test chamber.

(7) Upon entering the test chamber, give the employee a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA.

(8) Have the employee hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equal to that generated by the paper towel method.

(9) Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the employee; to explain the fit test, the importance of the employee's cooperation in the fit test, and the purpose for the test exercises; or to demonstrate some of the exercises.

(10) If at any time during the test, the employee detects the banana-like odor of IAA, the test is failed. The employee must quickly exit from the test chamber and leave the test area to avoid olfactory (smelling) fatigue.

(11) If the test is failed, the employee must return to the selection room and remove the respirator. The employee must:

- Repeat the odor sensitivity test;
- Select and put on another respirator;
- Return to the test area; and
- Again begin the fit test procedure described in subsections (1) through (8) of this section.

The process continues until a respirator that fits well has been found.

(12) Should the odor sensitivity test be failed, the employee must wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

(13) If the employee passes the test, the efficiency of the test procedure must be demonstrated by having the employee break the respirator face seal and take a breath before exiting the chamber.

(14) When the employee leaves the chamber, the employee must remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests.

(15) The used towels must be kept in a self-sealing plastic bag to keep the test area from being contaminated.
[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07211, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07212 Saccharin solution aerosol protocol (QLFT). The entire screening and testing procedure must be explained to the employee prior to conducting the screening test.
[Statutory Authority. RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07212, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07213 What are the taste threshold screening procedures for saccharin (QLFT)?

(1) Why use saccharin taste threshold screening?

The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the employee being tested can detect the taste of saccharin.

(2) What are the saccharin solution aerosol procedures?

(a) During threshold screening as well as during fit testing, the employee must wear an enclosure over the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, is adequate.

(b) The test enclosure must have a 3/4-inch (1.9 cm) hole in front of the employee's nose and mouth area to accommodate the nebulizer nozzle.

(c) Have the employee put on the test enclosure.

(d) Throughout the threshold screening test, the employee must breathe through a slightly open mouth with tongue extended.

(e) Instruct the employees to report when they detect a sweet taste.

(f) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer must be clearly marked to distinguish it from the fit test solution nebulizer.

(g) Saccharin threshold check solution. Prepare the threshold check solution by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution in 100 ml of distilled water.

(h) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

(i) Ten squeezes are repeated rapidly and then the employee is asked whether the saccharin can be tasted. If the employee tastes a sweet taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(j) If the first response is negative, ten more squeezes are repeated rapidly and the employee is again asked whether the saccharin is tasted. If the employee tastes a sweet taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(k) If the second response is negative, ten more squeezes are repeated rapidly and the employee is again asked whether the saccharin is tasted. If the employee tastes a sweet taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

(l) Note the number of squeezes required to solicit a taste response.

(m) If the saccharin is not tasted after 30 squeezes (step k), the employee is unable to taste saccharin and must not perform the saccharin fit test.

Note: If employees eat or drink something sweet before the screening test, they may be unable to taste the weak saccharin solution.

(n) If a taste response is elicited, ask the employee to take note of the taste for reference in the fit test.

(o) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

(p) The nebulizer must be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07213, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07214 What is the saccharin solution aerosol fit testing procedure (QLFT)?

(1) The employee must not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure described in WAC 296-62-07210.

(3) Have the employee put on the enclosure while wearing the respirator selected in WAC 296-62-07202. The respirator must be properly adjusted and equipped with a particulate filter(s).

(4) Use a second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent to spray the fit test solution into the enclosure. Clearly mark this nebulizer to distinguish it from the screening test solution nebulizer.

(5) Prepare the fit test solution adding 83 grams of sodium saccharin to 100 ml of warm water.

(6) As before, the employees must breathe through a slightly open mouth with tongue extended, and report if they taste the sweet taste of saccharin.

(7) Insert the nebulizer into the hole in the front of the enclosure and spray an initial concentration of saccharin fit test solution into the enclosure.

(8) Use the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test. A minimum of 10 squeezes is required.

(9) After generating the aerosol, instruct the employee to perform the exercises in WAC 296-62-07202.

(10) Replenish the aerosol concentration every 30 seconds using one half the original number of squeezes used initially (for example, 5, 10 or 15).

(11) Instruct the employees to tell you if at any time during the fit test the taste of saccharin is detected. If the employee does not detect tasting the saccharin, the test is passed.

(12) If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator must be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

(13) Since the nebulizer has a tendency to clog during use, periodically check the nebulizer to make sure that it is not clogged. If the nebulizer is clogged at the end of the test session, the test is invalid.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07214, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07217 Bitrex™ (denatonium benzoate) solution aerosol qualitative fit testing (QLFT) protocol. General information. The Bitrex™ (denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex™ is routinely used as a taste aversion agent in household liquids that children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure must be explained to the employee prior to the conduct of the screening test.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07217, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07218 What is the taste threshold screening procedure for Bitrex™ (QLFT)?

(1) Why use odor threshold screening?

The Bitrex™ taste threshold screening, performed without wearing a respirator, is intended to determine whether the employee being tested can detect the taste of Bitrex™.

(2) What are the taste threshold screening procedures for Bitrex™ (QLFT)?

(a) During threshold screening as well as during fit testing, employees must wear an enclosure over the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure must be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts #14 and #15 combined, is adequate.

(b) The test enclosure must have a 3/4-inch (1.9 cm) hole in front of the employee's nose and mouth area to accommodate the nebulizer nozzle.

(c) Have the employee put on the test enclosure.

(d) Throughout the threshold screening test, the employees must breathe through a slightly open mouth with tongue extended.

(e) Instruct the employees to tell you when they detect a bitter taste.

(f) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, spray the threshold check solution into the enclosure. Clearly mark this nebulizer to distinguish it from the fit test solution nebulizer.

(g) Prepare the threshold check solution by adding 13.5 milligrams of Bitrex™ to 100 ml of 5% salt (NaCl) solution in distilled water.

(h) To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.

(i) Rapidly repeat an initial ten squeezes and then ask the employee if the Bitrex™ can be tasted. If the employee reports tasting the bitter taste during the ten squeezes, the screening test is completed. Note the taste threshold as ten regardless of the number of squeezes actually completed.

(j) If the first response is negative, rapidly repeat ten more squeezes and ask the employee if the Bitrex™ is tasted. If the employee reports tasting the bitter taste during the second ten squeezes, the screening test is completed. Note the taste threshold as twenty regardless of the number of squeezes actually completed.

(k) If the second response is negative, rapidly repeat ten more squeezes and ask the employee if the Bitrex™ is tasted. If the employee reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. Note the taste threshold as thirty regardless of the number of squeezes actually completed.

(l) Note the number of squeezes required to solicit a taste response.

(m) If the Bitrex™ is not tasted after 30 squeezes (step k), the employee is unable to taste Bitrex™ and must not perform the Bitrex™ fit test.

(n) If a taste response is elicited, ask the employee to take note of the taste for reference in the fit test.

(o) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

(p) The nebulizer must be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four hours.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07218, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07219 What is the Bitrex™ solution aerosol fit testing procedure (QLFT)?

(1) The employee must not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure as that described in WAC 296-62-07210.

(3) Have the employee put on the enclosure while wearing the respirator selected according to WAC 296-62-07202. The respirator must be properly adjusted and equipped with any type particulate filter(s).

(4) Use a second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent to spray the fit test solution into the enclosure. Clearly mark this nebulizer to distinguish it from the screening test solution nebulizer.

(5) Prepare the fit test solution by adding 337.5 mg of Bitrex™ to 200 ml of a 5% salt (NaCl) solution in warm water.

(6) As before, the employees must breathe through a slightly open mouth with tongue extended.

(7) Instruct the employees to tell you when they detect the bitter taste of Bitrex™.

(8) Insert the nebulizer into the hole in the front of the enclosure. Spray an initial concentration of the fit test solution into the enclosure. Use the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required for the employee to taste the bitter tastes as noted during the screening test.

(9) After generating the aerosol, instruct the employee to perform the exercises in WAC 296-62-07203.

(10) Replenish the aerosol concentration every 30 seconds using one half the number of squeezes used initially (for example, 5, 10 or 15).

(11) Have the employees tell you if at any time during the fit test they taste the bitter taste of Bitrex™. If the employee does not detect tasting the Bitrex™, the test is passed.

(12) If the taste of Bitrex™ is tasted, the fit is deemed unsatisfactory and the test is failed. A different respirator must be tried and the entire test procedures must be repeated (taste threshold screening and fit testing).

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07219, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07222 Irritant smoke (stannic chloride) protocol (QLFT). This qualitative fit test uses a person's response to the irritating chemicals released in the “smoke” produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07222, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07223 What are the general requirements and precautions for irritant smoke fit testing (QLFT)?

(1) The respirator to be tested must be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).

(2) Use only stannic chloride smoke tubes for this protocol.

(3) Do not use any form of a test enclosure or hood.

(4) The smoke can be irritating to the eyes, lungs, and nasal passages. Take precautions to minimize the employee's exposure to irritant smoke. Sensitivity varies, and certain employees may respond to a greater degree to irritant smoke. Care must be taken when performing the sensitivity screening checks to use only the minimum amount of smoke necessary to elicit a response from the employee. Sensitivity screening checks determine whether the employee can detect the irritant smoke.

(5) The fit test must be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07223, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07224 What is the sensitivity screening check protocol for irritant smoke (QLFT)?

(1) Why use irritant smoke sensitivity screening checks?

Employees must be tested to see if they can detect a weak concentration of the irritant smoke.

(2) What are the sensitivity screening check procedures?

(a) Break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb.

(b) Cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.

(c) Advise the employees that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct them to keep their eyes closed while the test is performed.

(d) Allow the employee to smell a weak concentration of the irritant smoke before putting on a respirator to become familiar with its irritating properties and determine if they can detect the irritating properties of the smoke.

(e) Carefully direct a small amount of the irritant smoke toward the employees being tested to see if they can detect it.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07224, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07225 What is the irritant smoke fit testing procedure (QLFT)?

(1) Have the employee put on the respirator without assistance, and perform the required user seal check(s).

(2) Instruct the employees to keep their eyes closed.

(3) Direct the stream of irritant smoke from the smoke tube toward the face seal area of the employee, using the low flow pump or the squeeze bulb. Begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. Gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.

(4) If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.

(5) Have the employee perform the exercises required in WAC 296-62-07203 while the respirator seal is being continually challenged by the smoke. Direct the smoke around the perimeter of the respirator at a distance of six inches.

(6) If the employee being fit tested detects the irritant smoke at any time, the test is failed. An employee being retested must repeat the entire sensitivity check and fit test procedures.

(7) Have the employee remove the respirator.

(8) Give employees passing the irritant smoke test without evidence of a response (involuntary cough, irritation) a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test to determine if they still react to the smoke. The fit test is void if an employee does not respond to the smoke.

(9) If the employee responds to the second sensitivity check, then the fit test is passed.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07225, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07230 Appendix A-3: Quantitative Fit Testing (QNFT) Protocols for Respiratory Protection--Mandatory. This is a mandatory appendix to chapter 296-62 WAC, Part E, which includes WAC 296-62-07230 through 296-62-07248.

The following quantitative fit testing procedures are acceptable protocols:

- Nonhazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and employing instrumentation to quantify the fit of the respirator;
- Ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit;
- Controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a facepiece to quantify the respirator fit.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10), § 296-62-07230, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07231 What are the general requirements for quantitative fit testing (QNFT)?

(1) You must make sure that persons administering QNFT are able to:

- Calibrate equipment and perform tests properly;
- Recognize invalid tests;
- Calculate fit factors properly; and
- Make sure that test equipment is in proper working order.

(2) You must make sure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07231, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07233 Generated aerosol quantitative fit testing protocol (QNFT).

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07233, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07234 What equipment is required for generated aerosol fit testing (QNFT)?

(1) Instrumentation. Use aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols for quantitative fit testing.

(2) Test chamber.

(a) The test chamber must be large enough to permit all employees to perform freely all required exercises without disturbing the test agent concentration or the measurement apparatus.

(b) The test chamber must be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

(3) When testing air-purifying respirators, replace the normal filter or cartridge element with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.

(4) Select the sampling instrument so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.

(5) Do not expose the employee to any combination of substitute air-purifying elements, test agent and test agent concentration in excess of an established exposure limit for the test agent at any time during the testing process. Base the employee's exposure on the length of the exposure and the exposure limit duration.

(6) Construct the sampling port and place it on the test specimen respirator so that:

- No leaks occurs around the port (for example, where the respirator is probed);
- A free air flow is allowed into the sampling line at all times; and
- There is no interference with the fit or performance of the respirator.

The in-mask sampling device (probe) must be designed and used so that the air sample is drawn from the breathing zone of the employee, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 1/4-inch.

(7) The person administering the fit test must be able to observe the employee inside the chamber during the test.

(8) The equipment generating the test atmosphere must maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.

(9) Keep the time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) to a minimum. You must be able to clearly see when an event occurs and when it is recorded on the strip chart or computer.

(10) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port must be:

- Equal in diameter;
- Made of the same material; and
- Equal in length.

(11) The exhaust flow from the test chamber must pass through an appropriate filter (i.e., high efficiency particulate filter) before release.

(12) When sodium chloride aerosol is used, the relative humidity inside the test chamber must not exceed 50 percent.

(13) Take into account the limitations of instrument detection when determining the fit factor.

(14) Test respirators must be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07234, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07235 What are the procedures for generated aerosol quantitative fit testing (QNFT)?

(1) When performing the initial user seal check using a positive or negative pressure check, crimp the sampling line in order to avoid air pressure leakage during either of these pressure checks.

(2) Using an abbreviated screening QLFT test is optional. You may use a QLFT screening test to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. Another option is to use the CNC QNFT instrument in the count mode to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.

(3) A reasonably stable test agent concentration must be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, determine the test agent's stability after the employee has entered the test environment.

(4) Immediately after the employee enters the test chamber, measure the test agent concentration inside the respirator to make sure that the peak penetration does not exceed 5 percent for a half-mask or 1 percent for a full facepiece respirator.

(5) Obtain a stable test agent concentration prior to the actual start of testing.

(6) Do not over-tighten respirator restraining straps for testing. Have the employee adjust the straps, without assistance, to give a reasonably comfortable fit typical of normal use.

(7) Do not adjust the respirator once the fit test exercises begin.

(8) Stop the test whenever any single peak penetration exceeds 5 percent for half-masks and 1 percent for full facepiece respirators. The employee must be refitted and retested.

(9) Do not permit the employee to wear a half-mask or quarter facepiece respirator unless:

- A minimum fit factor of 100 is obtained; or
- A full facepiece respirator unless a minimum fit factor of 500 is obtained.

(10) Filters used for quantitative fit testing must be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07235, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07236 How are fit factors calculated (QNFT)?

(1) Determine the fit factor for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.

(2) Calculate the average test chamber concentration using one of the following:

- Arithmetic average of the concentration measured before and after each test (i.e., 7 exercises); or
- Arithmetic average of the concentration measured before and after each exercise; or
- True average measured continuously during the respirator sample.

(3) Determine the concentration of the challenge agent inside the respirator by one of the following methods:

(a) Average peak penetration method. Average peak penetration method determines how much test agent penetrates into the respirator using a strip chart recorder, integrator, or computer. Determine the agent penetration averaging the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise also will meet the requirements of the average peak penetration method.

(b) Maximum peak penetration. Maximum peak penetration method determines how much test agent penetrates into the respirator using a strip chart recordings of the test. The highest peak penetration for a given exercise represents the average penetration into the respirator for that exercise.

(c) Area under the peaks. Integrate the area under the individual peak for each exercise except the grimace exercise using computerized integration or other appropriate calculations.

(d) Overall fit factor. Calculate the overall fit factor using individual exercise fit factors.

- Convert the exercise fit factors to the penetration values.
- Determine the average.
- Then convert the average result back to a fit factor.

Use the following equation to calculate overall fit factor:

$$\text{Overall Fit Factor} = \frac{\text{Number of exercises}}{1/ff_1 .+ 1/ff_2 .+ 1/ff_3 .+ 1/ff_4 .+ 1/ff_5 .+ 1/ff_6 .+ 1/ff_7 .+ 1/ff_8}$$

Where ff_1, ff_2, ff_3, etc. are the fit factors for exercises 1, 2, 3, etc.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07236, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07238 Ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07238, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07239 General information about ambient aerosol condensation nuclei counter (CNC) protocol (QNFT).

(1) The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (Portacount™) protocol uses a probe to quantitatively fit tests respirators. A probed respirator has a special sampling device, installed on the respirator, that allows the probe to sample the air from inside the mask.

(2) The probed respirator is only used for quantitative fit tests.

(3) A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor.

(4) The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an employee's own respirator.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07239, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07240 What are the general requirements for ambient aerosol condensation nuclei counter (CNC) protocol (QNFT)?

(1) A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator.

(2) A minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator.

(3) The entire screening and testing procedure must be explained to the employee prior to the conduct of the screening test.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07240, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07242 What are the Portacount fit testing procedures?

(1) Check the respirator to make sure the:

- Sampling probe and line are properly attached to the facepiece; and
- Respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (for example, NIOSH 42 CFR 82 series 100, series 99, or series 95 particulate filter) per manufacturer's instruction.

(2) Instruct the employee to put on the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the employee to make certain the respirator is comfortable. Before fit testing, train the employee on how to wear the respirator properly.

(3) Check the following conditions for the adequacy of the respirator fit:

- Chin properly placed;
- Adequate strap tension, not overly tightened;
- Fit across nose bridge;
- Respirator of proper size to span distance from nose to chin;
- Tendency of the respirator to slip;
- Self-observation in a mirror to evaluate fit and respirator position.

(4) Have the employee do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.

(5) Follow the manufacturer's instructions for operating the Portacount and begin the test.

(6) Have the employee perform the exercises in WAC 296-62-07203.

(7) After the test exercises, ask the employee about comfort of the respirator. If the respirator is unacceptable, try another model of respirator.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07242, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07243 How is the Portacount test instrument used?

(1) The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The pass or fail message will indicate whether or not the test was successful. If the test was a pass, the fit test is over.

(2) Since the pass or fail criterion of the Portacount is user programmable, you must make sure that the pass or fail criterion meets the requirements for minimum respirator performance in WAC 296-62-07235.

(3) Keep a record of successful fit tests on file. The record must contain:

- The employee's name;
- Overall fit factor;
- Make, model, style, and size of respirator used; and
- Date tested.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07243, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07245 Controlled negative pressure (CNP) quantitative fit testing protocol (QNFT).

The CNP protocol provides an alternative to aerosol fit test methods.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07245, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07246 How does controlled negative pressure (CNP) fit testing work (QNFT)?

(1) The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator.

(2) The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators.

(3) Manufacturer attachments. The CNP instrument manufacturer Dynatech Nevada also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in an employee's own respirator.

(4) Performing the test. To perform the test, the employees close their mouths and hold their breath, after which an air pump removes air from the respirator facepiece at a preselected constant pressure.

(5) Facepiece fit. The facepiece fit is expressed as the leak rate through the facepiece, expressed as milliliters per minute.

(6) The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07246, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07247 What are the controlled negative pressure (CNP) fit testing requirements and procedures (QNFT)?

(1) Fit factor.

- A minimum fit factor pass level of 100 is necessary for a half-mask respirator.
- A minimum fit factor of at least 500 is required for a full facepiece respirator.

(2) The entire screening and testing procedure must be explained to the employee prior to the conduct of the screening test.

(3) The instrument must have a nonadjustable test pressure of 15.0 mm water pressure.

(4) When performing fit tests, set the CNP system defaults at:

- 15 mm of water (-0.58 inches of water) test pressure and
- 53.8 liters per minute for the modeled inspiratory flow rate.

Note: CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.

(5) The person conducting the CNP fit testing must be thoroughly trained to perform the test.

(6) Replace the respirator filter or cartridge with the CNP test manifold. Temporarily remove or prop open the inhalation valve downstream from the manifold.

(7) Train employees to hold their breath for at least 20 seconds.

(8) Have the employee put on the test respirator without any assistance from the individual who conducts the CNP fit test.

(9) The QNFT protocol must be followed according to WAC 296-62-07231 with an exception for the CNP test.

(10) The test instrument must have an effective audio warning device when the employee fails to hold his or her breath during the test.

(11) Stop the test whenever the employees fail to hold their breath. The employees must be refitted and retested.

(12) A record of the test must be kept on file, assuming the fit test was successful. The record must contain the employee's name; overall fit factor; make, model, style and size of respirator used; and date tested.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07247, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07248 What test exercises are required for controlled negative pressure (CNP) fit testing (QNFT)?

(1) Normal breathing. In a normal standing position, without talking, the employees must breathe normally for 1 minute. After the normal breathing exercise, the employees must hold their head straight ahead and hold their breath for 10 seconds during the test measurement.

(2) Deep breathing. In a normal standing position, the employees must breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the employees must hold their head straight ahead and hold their breath for 10 seconds during test measurement.

(3) Turning head side to side.

- Standing in place, the employees must slowly turn their heads from side to side between the extreme positions on each side for 1 minute, holding their heads each extreme momentarily so they can inhale at each side.

- After the turning head side to side exercise, have the employees hold their heads full left and hold their breath for 10 seconds during test measurement.
- Next, have the employees need to hold their head full right and hold their breath for 10 seconds during test measurement.

(4) Moving head up and down.

- Standing in place, the employees must slowly move their heads up and down for 1 minute.
- Instruct the employee to inhale in the up position (when looking toward the ceiling).
- After the moving head up and down exercise, the employees must hold their heads full up and hold their breath for 10 seconds during test measurement.
- Next, the employees must hold their heads full down and hold their breath for 10 seconds during test measurement.

(5) Talking. The employee must talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The employee can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1 minute. After the talking exercise, the employee must hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(6) Grimace. The employee must grimace by smiling or frowning for 15 seconds.

(7) Bending over. Employees must bend at the waist as if they were touching their toes for 1 minute. Jogging in place must be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the employees must hold their head straight ahead and hold their breath for 10 seconds during the test measurement.

(8) Normal Breathing.

- The employee must remove and put on the respirator again within a one-minute period.
- Then, in a normal standing position, without talking, the employee must breathe normally for 1 minute.
- After the normal breathing exercise, the employee must hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(9) After the test exercises, question the employee about the comfort of the respirator. If the respirator has become unacceptable, another model of a respirator must be tried.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07248, filed 05/04/99, effective 09/01/99.]

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WAC 296-62-07251 Appendix B-1: User Seal Check Procedures--Mandatory. This is a mandatory appendix to chapter 296-62 WAC, Part E.

The individual who uses a tight-fitting respirator must perform a user seal check to make sure that the respirator makes an adequate seal each time it is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method must be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

(1) Facepiece positive and/or negative pressure checks.

(a) Positive pressure check. Close off the exhalation valve and exhale gently into the facepiece. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve. The face fit is considered adequate if a slight positive pressure (inflation) can be built up inside the facepiece without any evidence of outward leakage of air at the seal. Carefully replace the exhalation valve cover, if it was removed, after the test.

(b) Negative pressure check. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. If the design of the inlet opening of the cartridges cannot be effectively covered with the palm of the hand, cover the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

(2) Manufacturer's recommended user seal check procedures. The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures describe above provided that you demonstrate that the manufacturer's procedures are equally effective.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07251, filed 05/04/99, effective 09/01/99.]

Spanish version

WAC 296-62-07251: Apéndice B-1, (Obligatorio) Procedimiento del Usuario para la Prueba de Ajuste.

Este es un apéndice obligatorio del capítulo 296-62 WAC, Part E.

El individuo que utiliza un respirador ajustado debe realizar una prueba de ajuste para cerciorarse de que el respirador esté adecuadamente ajustado cada vez que se lo pone. Bien la prueba de presión positiva y negativa mencionada en este apéndice, o el método de ajuste recomendado por el fabricante del respirador debe ser utilizado. Las pruebas de ajuste del usuario no son substitutas para las pruebas cualitativas o cuantitativas de adaptación.

(1) Pruebas Positivas y/o Negativas del Respirador

(a) Pruebas de presión positivas. Ciérre la válvula de exhalación y exhale suavemente en el respirador. Para la mayoría de los respiradores, el método de prueba de escape de aire requiere que primero se quite la cubierta de la válvula de exhalación antes de cerrarla. El ajuste del respirador se considera adecuado si una presión positiva leve (inflación) se puede acumular dentro del respirador sin ninguna evidencia de salida de aire al exterior en el sello del respirador . Después de la prueba, cuidadosamente reinstale la cubierta de la válvula de la exhalación, si es que fue quitada.

(b) Pruebas de presión negativas. Cierre la apertura de entrada del cartucho cubriendolo con la palma de la mano o instalando las tapaderas del filtro, inhale suavemente de modo que el respirador se pliege levemente, y contenga la respiración por diez segundos. Si el diseño de la apertura de entrada de los cartuchos no se puede cubrir con eficacia con la palma de la mano, cubra la apertura de la entrada del cartucho con un guante fino de látex o de nitrile. Si el respirador permanece en su condición levemente plegada y no se detecta ninguna entrada de aire, la tensión del respirador se considera satisfactoria.

(2) Procedimientos de ajuste para el usuario recomendados por fabricante. Los procedimientos recomendados por el fabricante del respirador para realizar las pruebas de sellamiento del usuario se pueden utilizar en vez de las pruebas positivas y/o negativas descritas anteriormente siempre y cuando usted pueda demostrar que los procedimientos del fabricante son igualmente eficaces.

WAC 296-62-07253 Appendix B-2: Respirator Cleaning Procedures--Mandatory. This is a mandatory appendix to chapter 296-62 WAC, Part E.

(1) These procedures are provided for you to use when cleaning respirators. They are general in nature, and as an alternative you may use the cleaning recommendations provided by the manufacturer of the respirators used by your employees, if the manufacturer's procedures are as effective as those listed here in Appendix B-2. Procedures are as effective when they meet the requirements in Appendix B-2, i.e., that must make sure that the respirator is properly cleaned and disinfected so that the respirator is not damaged and does no harm to the user.

(2) Procedures for cleaning respirators.

(a) Remove filters, cartridges, or canisters. Remove speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

(b) Wash components in warm (43°C [110°F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

(c) Rinse components thoroughly in clean, warm (43°C [110°F] maximum), preferably running water. Drain.

(d) When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

(i) Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43°C (110°F); or,

(ii) Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43°C (110°F); or,

(iii) Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

(e) Rinse components thoroughly in clean, warm (43°C [110°F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

(f) Components should be hand-dried with a clean lint-free cloth or air-dried.

(g) Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

(h) Test the respirator to make sure that all components work properly.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07253, filed 05/04/99, effective 09/01/99.]

Spanish version

WAC 296-62-07253: Apéndice B-2 (Obligatorio) Procedimientos De Limpieza Del Respirador.

Este es un apéndice obligatorio del capítulo 296-62 WAC, Parte E.

(1) Estos procedimientos son proporcionados para que usted los use cuando esté limpiando los respiradores. Los procedimientos son generales en naturaleza, y como una alternativa utilizar las recomendaciones de limpieza proporcionadas por el fabricante de los respiradores usados por sus empleados, si es que los procedimientos del fabricante son tan eficaces como ésos enumerados aquí en el apéndice B-2. Procedimientos son tan eficazes cuando son iguales a los requisitos en el apéndice B-2, es decir, que debe cerciorarse de que el respirador haya sido limpiado y desinfectado correctamente para que no sea dañado y no dañe al usuario.

(2) Procedimientos Para Limpiar Respiradores

(a) Quite los filtros, los cartuchos, o los filtros de bote. Quite los diafragmas , la válvula de presión y demanda, mangueras, o cualquier otro componente recomendado por el fabricante. Deseche o repare cualquier pieza defectuosa.

(b) Lave los componentes en agua tibia (43 grados C [110 grados F]) y con un detergente suave o con un limpiador recomendado por el fabricante. Un cepillo tieso de la cerda (no alambre) se puede utilizar para facilitar remover de la suciedad.

(c) Enjuague los componentes a fondo en agua limpia y tibia (43 grados C [110 grados F]), preferiblemente con agua corriente. Saquelos del agua.

(d) Cuando el limpiador usado no contiene desinfectante, los componentes del respirador se deben sumergirse por dos minutos en uno del siguiente desinfectantes:

(i) Solución del hipoclorito (50 PPM de cloro) hecha agregando aproximadamente un mililitro de cloro limpiaropa a un litro de agua a 43 grados C (110 grados F); o,

(ii) Solución acuosa del yodo (50 PPM de yodo) hecha agregando aproximadamente 0.8 mililitros de tinte de yodo (6-8 gramos de amonia y/o yoduro de potasio /100 cc del alcohol 45%) a un litro de agua a 43 grados C (110 grados F); o,

(iii) Otros productos para la limpieza comerciales de calidad desinfectante equivalente cuando se utilizan según las instrucciones, si su uso es recomendado o aprobado por el fabricante del respirador.

(e) Enjuague los componentes a fondo en agua limpia, y tibia (43 grados C [110 grados F]), preferiblemente con agua corriente. Saquelos del agua. Es muy importante enjuagar cuidadosamente los componentes. Los detergentes o los desinfectantes que se secan en los respiradores pueden causar dermatitis. Además, algunos desinfectantes, si no se remueven totalmente, pueden causar deterioración del plastico, o corroer las piezas de metal.

(f) Los componentes deben de secarse a mano con un trapo sin pelusa o ser secados con aire.

(g) Reasamble el repirador, cambie los filtros, los cartuchos, y los filtors de bote cuando sea necesario.

(h) Pruebe el respirador para cerciorarse de que todos los componentes trabajan correctamente.

WAC 296-62-07255 Appendix C: WISHA Respirator Medical Evaluation Questionnaire--Mandatory.
This is a mandatory appendix to chapter 296-62 WAC, Part E.

To the employer:
You must not review employee questionnaires.

To the employer's PLHCP:
Answers to questions in Section 1 and question 9 in Section 2 of Part A do not require further medical evaluations.

To the employee:
Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A. Section 1. Mandatory

The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date:_____ 2. Your name:_____

3. Your age (to nearest year):_____ 4. Sex (circle one): Male / Female

5. Your height:_____ft._____in. 6. Your weight:_____lbs.

7. Your job title:_____

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code):_____

9. The best time to telephone you at this number:_____

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes / No

11. Check the type of respirator you will use (you can check more than one category):

a._____N, R, or P filtering facepiece respirator (dust mask style, half facepiece respirators without cartridges).

b._____Check all that apply.

☐ Half mask ☐ Full facepiece mask ☐ Helmet hood ☐ Escape

☐ Non-powered cartridge or canister ☐ Powered air-purifying cartridge respirator (PAPR)

☐ Supplied-air or Air-line

Self contained breathing apparatus (SCBA): ☐ Demand or ☐ Pressure demand

Other:_____

12. Have you worn a respirator (circle one): Yes / No

If "yes," what type(s):_____

_____

Part A. Section 2. Mandatory

Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month: Yes / No

2. Have you *ever had* any of the following conditions?

a.	Seizures (fits):	Yes /	No
b.	Diabetes (sugar disease):	Yes /	No
c.	Allergic reactions that interfere with your breathing:	Yes /	No
d.	Claustrophobia (fear of closed-in places):	Yes /	No
e.	Trouble smelling odors:	Yes /	No

3. Have you *ever had* any of the following pulmonary or lung problems?

a.	Asbestosis:	Yes /	No
b.	Asthma:	Yes /	No
c.	Chronic bronchitis:	Yes /	No
d.	Emphysema:	Yes /	No
e.	Pneumonia:	Yes /	No
f.	Tuberculosis:	Yes /	No
g.	Silicosis:	Yes /	No
h.	Pneumothorax (collapsed lung):	Yes /	No
i.	Lung cancer:	Yes /	No
j.	Broken ribs:	Yes /	No
k.	Any chest injuries or surgeries:	Yes /	No
l.	Any other lung problem that you've been told about:	Yes /	No

4. Do you *currently* have any of the following symptoms of pulmonary or lung illness?

a.	Shortness of breath:	Yes /	No
b.	Shortness of breath when walking fast on level ground or walking up a slight hill or incline:	Yes /	No
c.	Shortness of breath when walking with other people at an ordinary pace on level ground:	Yes /	No
d.	Have to stop for breath when walking at your own pace on level ground:	Yes /	No
e.	Shortness of breath when washing or dressing yourself:	Yes /	No
f.	Shortness of breath that interferes with your job:	Yes /	No
g.	Coughing that produces phlegm (thick sputum):	Yes /	No
h.	Coughing that wakes you early in the morning:	Yes /	No
i.	Coughing that occurs mostly when you are lying down:	Yes /	No
j.	Coughing up blood in the last month:	Yes /	No
k.	Wheezing:	Yes /	No
l.	Wheezing that interferes with your job:	Yes /	No
m.	Chest pain when you breathe deeply:	Yes /	No
n.	Any other symptoms that you think may be related to lung problems:	Yes /	No

Part A. Section 2. Mandatory (Cont.)

5. Have you *ever had* any of the following cardiovascular or heart problems?

a.	Heart attack:	Yes	/	No
b.	Stroke:	Yes	/	No
c.	Angina:	Yes	/	No
d.	Heart failure:	Yes	/	No
e.	Swelling in your legs or feet (not caused by walking):	Yes	/	No
f.	Heart arrhythmia (heart beating irregularly):	Yes	/	No
g.	High blood pressure:	Yes	/	No
h.	Any other heart problem that you've been told about:	Yes	/	No

6. Have you *ever had* any of the following cardiovascular or heart symptoms?

a.	Frequent pain or tightness in your chest:	Yes	/	No
b.	Pain or tightness in your chest during physical activity:	Yes	/	No
c.	Pain or tightness in your chest that interferes with your job:	Yes	/	No
d.	In the past two years, have you noticed your heart skipping or missing a beat:	Yes	/	No
e.	Heartburn or indigestion that is not related to eating:	Yes	/	No
f.	Any other symptoms that you think may be related to heart or circulation problems:	Yes	/	No

7. Do you *currently* take medication for any of the following problems?

a.	Breathing or lung problems:	Yes	/	No
b.	Heart trouble:	Yes	/	No
c.	Blood pressure:	Yes	/	No
d.	Seizures (fits):	Yes	/	No

8. If you've used a respirator, have you *ever had* any of the following problems? (If you've never used a respirator, check the following space and go to question 9:)

a.	Eye irritation:	Yes	/	No
b.	Skin allergies or rashes:	Yes	/	No
c.	Anxiety:	Yes	/	No
d.	General weakness or fatigue:	Yes	/	No
e.	Any other problem that interferes with your use of a respirator:	Yes	/	No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes / No

Part A. Section 3. Mandatory for SCBA or Full Facepiece Respirator Users

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you *ever lost* vision in either eye (temporarily or permanently): Yes / No

11. Do you *currently* have any of the following vision problems?

a.	Wear contact lenses:	Yes / No
b.	Wear glasses:	Yes / No
c.	Color blind:	Yes / No
d.	Any other eye or vision problem:	Yes / No

12. Have you *ever had* an injury to your ears, including a broken ear drum: Yes / No

13. Do you *currently* have any of the following hearing problems?

a.	Difficulty hearing:	Yes / No
b.	Wear a hearing aid:	Yes / No
c.	Any other hearing or ear problem:	Yes / No

14. Have you *ever had* a back injury: Yes / No

15. Do you *currently* have any of the following musculoskeletal problems?

a.	Weakness in any of your arms, hands, legs, or feet:	Yes / No
b.	Back pain:	Yes / No
c.	Difficulty fully moving your arms and legs:	Yes / No
d.	Pain or stiffness when you lean forward or backward at the waist:	Yes / No
e.	Difficulty fully moving your head up or down:	Yes / No
f.	Difficulty fully moving your head side to side:	Yes / No
g.	Difficulty bending at your knees:	Yes / No
h.	Difficulty squatting to the ground:	Yes / No
i.	Climbing a flight of stairs or a ladder carrying more than 25 lbs:	Yes / No
j.	Any other muscle or skeletal problem that interferes with using a respirator:	Yes / No

Part B: PLHCP Discretionary Questions

If appropriate to specific job requirements or conditions, additional questions -- including but not limited to the following -- may be added at the discretion of the health care professional to clarify an employee's ability to use a respirator.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes / No
   If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes / No
2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (for example, gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes / No
   If "yes," name the chemicals if you know them:
3. Have you ever worked with any of the materials, or under any of the conditions, listed below:
   a. Asbestos: Yes / No
   b. Silica (for example, in sandblasting): Yes / No
   c. Tungsten/cobalt (for example, grinding or welding this material): Yes / No
   d. Beryllium: Yes / No
   e. Aluminum: Yes / No
   f. Coal (for example, mining): Yes / No
   g. Iron: Yes / No
   h. Tin: Yes / No
   i. Dusty environments: Yes / No
   j. Any other hazardous exposures: Yes / No
      If "yes," describe these exposures:
4. List any second jobs or side businesses you have:
5. List your previous occupations:
6. List your current and previous hobbies:
7. Have you been in the military services? Yes / No
   If "yes," were you exposed to biological or chemical agents (either in training or combat): Yes / No
8. Have you ever worked on a HAZMAT team? Yes / No
9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes / No
   If "yes," name the medications if you know them:
10. Will you be using any of the following items with your respirator(s)?
    a. HEPA Filters: Yes / No
    b. Canisters (for example, gas masks): Yes / No
    c. Cartridges: Yes / No
11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:
    a. Escape only (no rescue): Yes / No
    b. Emergency rescue only: Yes / No
    c. Less than 5 hours *per week:* Yes / No
    d. Less than 2 hours *per day:* Yes / No
    e. 2 to 4 hours per day: Yes / No
    f. Over 4 hours per day: Yes /No

Part B: PLHCP Discretionary Questions (cont.)

12. During the period you are using the respirator(s), is your work effort:

    a. *Light* (less than 200 kcal per hour): Yes / No
    If "yes," how long does this period last during the average shift:_____hrs._____mins.
    Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.

    b. Moderate (200 to 350 kcal per hour): Yes / No
    If "yes," how long does this period last during the average shift:_____hrs._____mins.
    Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

    c. *Heavy* (above 350 kcal per hour): Yes / No
    If "yes," how long does this period last during the average shift:_____hrs._____mins.
    Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.)

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes / No If "yes," describe this protective clothing and/or equipment:

14. Will you be working under hot conditions (temperature exceeding 77 deg.F): Yes / No

15. Will you be working under humid conditions: Yes / No

16. Describe the work you'll be doing while you're using your respirator(s):

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):
    Name of the first toxic substance:
    Estimated maximum exposure level per shift:
    Duration of exposure per shift:

    Name of the second toxic substance:
    Estimated maximum exposure level per shift:
    Duration of exposure per shift:

    Name of the third toxic substance:
    Estimated maximum exposure level per shift:
    Duration of exposure per shift:

    The name of any other toxic substances that you'll be exposed to while using your respirator:

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security):

[Statutory Authority: RCW 49.17.010, .040, .050. 00-21-100 (Order 00-06), § 296-62-07255, filed 10/18/00, effective 01/01/01. Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07255, filed 05/04/99, effective 09/01/99.]

Spanish version

WAC 296-62-07255 Apéndice C (Obligatorio) Cuestionario de evaluacion Medica requerido por WISHA para el uso de respiradores. Esto es un apéndice obligatorio dell capítulo 296-62 WAC, part E.

Para el patrón:
Usted no debe revisar los cuestionarios del empleado.

Para profesional de salud:
Las respuestas a las preguntas en la sección 1 y la pregunta 9 de la sección 2 de la parte A no requieren otras evaluaciones médicas.

Para el empleado:
Su patrón debe permitir que usted conteste a este cuestionario durante horas de trabajo o en un lugar que sea conveniente para usted. Para mantener este cuestionario confidencial, su patrón o supervisor no debe ver o revisar sus respuestas y su patrón debe decirle cómo entregar o enviar este cuestionario al profesional de salud con licencia autorizado por el estado.

Parte A. Sección 1. Obligatorio

La información siguiente se debe proporcionar por todos los empleados que han sido seleccionados utilizar cualquier tipo de respirador (por favor use letra de molde).

1. Fecha:_____ 2. Nombre:_____
3. Edad:_____ 4. Sexo. (círcule uno): Hombre / Mujer
5. Cuanto mide?:_____ pies _____ pulgadas. 6. Cuanto pesa?:_____ libras.
7. Título o tipo de trabajo: _____
8. Número de teléfono donde pueda comunicarse el profesional de salud que haya revisado su cuestionario (incluya el area): _____
9. La mejor hora para llamarle a este número:_____
10. Le a dicho su patrón como ponerse en contacto con el profesional de salud que revisará este cuestionario (círcule uno): Si / No
11. Anote el tipo de respirador que va a utilizar (puede anotar más de una categoría):
    a. _____ Respirador disponible de R, N o P (máscarilla contra el polvo, respiradores sin los cartuchos).
    b. _____ Anote todo lo que use.
    - ☐ Respirador de media careta ☐ Respirador de careta completa ☐ Respirador de casco
    - ☐ Respirador de escape ☐ Respirador no electrico de cartuchos o de bote
    - ☐ Respirador con manguera con soplador ☐ Respirador con linea de aire
    - ☐ Mascarilla disponible (ejemplo N-95)
    - ☐ Aparato repiratorio autonomo: ☐ en demanda o ☐ demanda de pressión
    - Otro:_____
12. Ha usado algun tipo de respirador (círcule uno): Si / No
    Si es que si, que tipo? _____
    _____

Parte A. Sección 2. Obligatorio

Las preguntas del 1 al 9 se deben de contestar por cada empleado que fue seleccionado para usar cualquier tipo de respirador (Marque con un circulo para indicar sus respuestas).

1. Corrientemente, fuma tabaco o ha fumado durante el mes pasado? Si / No

2. Ha tenido algunas de las las siguientes condiciones medicas?

   a. Covulsiones: Si / No
   b. Diabetes (azúcar en la sangre): Si / No
   c. Reacciones alérgicas que interfieren con su respiración: Si / No
   d. Claustrofobia (miedo de estar en epacios cerrados): Si / No
   e. Dificultad de oler: Si / No

3. Ha tenido alguno de los siguientes problemas pulmonares o problemas del pulmón?

   a. Asbestosis: Si / No
   b. Asma: Si / No
   c. Bronquitis crónica: Si / No
   d. Enfisema: Si / No
   e. Pulmonía: Si / No
   f. Tuberculosis: Si / No
   g. Silicosis: Si / No
   h. Neumotorax (pulmón colapsado): Si / No
   i. Cáncer del pulmón: Si / No
   j. Costillas rotas: Si / No
   k. Lesiones o cirugías en el pecho: Si / No
   l. Cualquier otro problemas pulmónares: Si / No

4. Actualmente, tiene usted algunos de los síntomas siguientes de enfermedades pulmonares o problems del pulmon?

   a. Repiración dificultosa: Si / No
   b. Respiración dificultosa al caminar rápidamente en lugares planos o al caminar en una colina o una pendiente leve: Si / No
   c. Respiración dificultosa al caminar con gente en un paso ordinario en lugares planos: Si / No
   d. Tiene que pararse a respirar al caminar en su propio paso en lugares planos: Si / No
   e. Problemas de respiración al bañarse o al vestirse: Si / No
   f. Respiración dificultosa que interfiere con su trabajo: Si / No
   g. Tos que produce flema (esputo grueso): Si / No
   h. Tos que lo despierta temprano en la mañana: Si / No
   i. Tos que ocurre generalmente cuando está acostado: Si / No
   j. Tos con sangre en el mes pasado: Si / No
   k. Respiración jadeante: Si / No
   l. Repiración jadeante que interfiere con su trabajo: Si / No
   m. Dolor en el pecho cuando respira profundamente: Si / No
   n. Cualquier otro síntoma que usted piense se relacione a problemas del pulmón: Si / No

(Continuación) Parte A. Sección 2. Obligatorio

5. Ha tenido en el pasado cualquiera de los siguientes problemas cardiovasculares o del corazón ?

a.	Ataque del corazón:	Si	/	No
b.	Ataque cerebrovascular:	Si	/	No
c.	Angina de pecho:	Si	/	No
d.	Paro cardíaco:	Si	/	No
e.	Hinchazón del de los pies o piernas (no causada por caminar):	Si	/	No
f.	Arritmia del corazón:	Si	/	No
g.	Alta presión:	Si	/	No
h.	Cualquier otro problema del corazón que usted sepa?:	Si	/	No

6. Ha tenido en el pasado cualquiera de los siguientes síntomas cardiovasculares o del corazón ?

a.	Dolor en el pecho o pecho apretado? :	Si	/	No
b.	Dolor en el pecho o pecho apretado durante actividad física:	Si	/	No
c.	Dolor en el pecho o pecho apretado que lo lo deja trabajar normalmente:	Si	/	No
d.	En los últimos dos años, ha notado que el corazón le salta, que falla un látido:	Si	/	No
e.	Acedías o indigestion o que no se relacionen con la comida:	Si	/	No
f.	Cualquier otro síntoma que usted piense puede ser causado por los problemas del corazón o de la circulación de la sangre?:	Si	/	No

7. Está tomado medicina para alguno de los siguientes problemas ?

a.	Problemas de la respiración o del pulmón:	Si	/	No
b.	Problemas del corazón:	Si	/	No
c.	Alta presión:	Si	/	No
d.	Convulsiones:	Si	/	No

8. Si ha usado un respirador, ha tenido algunos de los siguientes problemas ? (si usted nunca ha usado un respirador, pase a la pregunta 9.)

a.	Irritación en los ojos:	Si	/	No
b.	Alergias o erupciones de la piel:	Si	/	No
c.	Ansiedad:	Si	/	No
d.	Debilidad general o fatiga desacostumbrada:	Si	/	No
e.	Cualquier otro problema que interfiera con el uso de un respirador:	Si	/	No

9. Le gustaría hablar sobre las respuestas con el profesional de salud que revisará este cuestionario? Si / No

Parte A. Section 3. (Obligatorio) Para usuarios de aparato respiratorio autonomo (SCBA) o respiradores de careta completa

Las preguntas del 10 al 15 deben ser contestadas por los empleado seleccionados para usar un respirador de careta completa o un aparato respiratorio autónomo (SCBA). Los empleados que usan otro tipo de respiradores no tienen que contestar estas preguntas.

10. Ha perdido la vista en cualquier ojo (temporalmente o permanentemente): Si / No

11. En la actualidad, tiene cualesquiera de los problemas siguientes con la vista?

    a. Usa lentes de contacto: Si / No
    b. Usa lentes: Si / No
    c. Daltonismo (dificultd de distinguir colores): Si / No
    d. Tiene problemas con los ojos o la vista?: Si / No

12. Ha sufrido una lesión en los oídos, incluyendo rotura del tímpano ?: Si / No

13. Actualmente, tiene algunos de los siguientes problemas para oir?:

    a. Dificultad para oir: Si / No
    b. Usa un aparato para oir: Si / No
    c. Tiene algun otro problema en los oidos o dificultad de escuchar?: Si / No

14. Se ha dañado o lastimado la espalda?: Si / No

15. Tiene en la actualidad uno de los siguientes problemas musculoesqueletales?

    a. Debilidad en los brazos, manos, piernas, o pies: Si / No
    b. Dolor de espalda : Si / No
    c. Dificultad para movere completamente los brazos y las piernas: Si / No
    d. Dolor o engarrotamiento cuando se inclina para adelante o para atras: Si / No
    e. Dificultad patra mover la cabeza completamente arriba opara abajo: Si / No
    f. Dificultad para mover la cabeza a los lados: Si / No
    g. Dificultad para agacharse doblando las rodillas: Si / No
    h. Dificultad para agacharse hast tocar el piso: Si / No
    i. Dificultad de subir una escalera cargando mas de 25 libras: Si / No
    j. Algun otro problema múscular o esquelétal que interfiera con el uso del respirador: Si / No

Parte B – Preguntas Discrecionales

Si es apropiado para las condiciones o requerimientos especificos de un trabajo, preguntas adicionales – incluyendo, pero no limitadas a las siguientes , pueden ser agregadas al cuestionario a discrecion del profesional de salud.

1. En el presente trabajo, ha trabajado en alturas altas (arriba de 5,000 pies) o en sitios que tienen menos oxigeno de lo normal?: Si/No
   Si la respuesta es “Si”, se ha sentido mareado, o ha tenido dificultad para respirar, palpitaciones, o cualquier otro síntoma que usted no tiene cuando no esta trabajando bajo estas condiciones: Si/No

2. En el trabajo o en su casa, ha estado expuesto a solventes o contaminantes peligrosos en el aire (por ejemplo, gases, humos, o polvos) o ha tenido contacto de la piel con quimicos peligrosos?: Si/No
   Escriba las quimicas y productos con las que ha estado expuesto, si sabe cuales son:

3. Ha trabajado con los siguientes materiales o las condiciones anotadas abajo?:
   a. Asbestos: Si/No
   b. Silice (Limpiar mediante un chorro de arena): Si/No
   c. Tungsteno/Cobalto (pulverizar o soldadura): Si/No
   d. Berilio: Si/No
   e. Aluminio: Si/No
   f. Carbon de piedra (minando): Si/No
   g. Hierro: Si/No
   h. Estaño: Si/No
   i. Ambiente polvoriento: Si/No
   j. Otra exposicion peligrosa: Si/No
      Si es que si, describa las exposiciones peligrosas:

4. Anote otros trabajos o un negocio secundarios, (aparte de este) que usted tenga:

5. Apunte sus trabajos previos:

6. Apunte sus pasatiempos previos:

7. Ha ido al servicio militar?: Si/No

Si la respuesta es si, ha estado expuesto a agentes quimicos o biologicos durante entrenamiento o combate?: Si/No

8. Ha trabajado usted en un equipo de HAZMAT?: Si/No

9. Esta tomando alguna medicina que no haya mencionado en este cuestionario (incluyendo remedios caseros o medicinas que compra sin receta)?: Si/No
   Si la respuesta es “Si”, cuales son?

10. Va usted a usar algunas de las siguientes partes con su respirator?: Si/No
    a. Filtros HEPA: Si/No
    b. Filtros de bote (por ejemplo, caretas antigás): Si/No
    c. Cartuchos : Si/No

11. Cuantas veces espera usar el respirador? (círcule " sí " o " no " en las respuestas que se aplican a usted)?
    a. Escape solamente (no rescate): Si/No
    b. Rescate de emergencia solamente: Si/No
    c. Menos de 5 horas por semana: Si/No
    d. Menos de 2 horas por día: Si/No
    e. 2 a 4 horas por día: Si/No
    f. Mas de 4 horas por día: Si/No

(Continuación) Parte B – Preguntas Discrecionales

12. Durante el período que usa el respirador, el esfuerzo del trabajo es:
    a. Ligero (menos de 200 kcal por hora): Si/No
    Si es que sí, cuánto tiempo dura este período durante el turno?: _____hrs. _____min.
    Ejemplos de trabajos ligeros son: estár sentando escribiendo, escribiendo a máquina, trabajando la línea de montaje, realizando trabajo de asambleo ligero; o estando parado mientras que opera un taladro (1-3 libras.) o controlando máquinas .

    b. Moderado (200 a 350 kcal por hora): Si/No
    Si es que sí cuánto tiempo dura este período durante el turno?: _____hrs. _____min.
    Ejemplos de trabajos moderados son: estár sentado clavando o el archivando; conducir un camion o un autobús en tráfico urbano; estar parado mientras que perfora, clava, asamblando, o transfiriendo una carga moderada (como de 35 libras) al nivel de la cintura; el caminar en una superficie plana a 2 mph o bajando a 3 millas por hora; o empujando una carretilla con una carga pesada (cerca de 100 libras.) en una superficie plana.

    c. Pesado (sobre 350 kcal por hora): Si/No
    Si es que sí, Si es que sí cuánto tiempo dura este período durante el turno?: _____hrs. _____min.
    Ejemplos de trabajos pesados: levantando cargas pesadas (cerca de 50 libras.) del piso a la altura de la cintura u hombros; trabajando cargando o descargando; trabajar con una pala; trabajar de albañil o demenuzando moldes; subir un nivel inclinado de 8 grados a dos millas por hora; subir las escaleras con una carga pesada (cerca de 50 libras).

13. Va usted a usar la ropa protectora y/o equipo protector (otro que no sea el respirador) cuando esté usando el respirador?: Si/No Si es que si, describa esta ropa protectora y/o equipo protector

14. Va usted a trabajar bajo condiciones calientes? (temperatura que excede 77 grados F): Si/No

15. Va usted a trabajar bajo condiciones húmedas?: Si/No

16. Describa el tipo de trabajo que usted hará mientras que usa el respirador:

17. Describa cualquier otra situación especial o peligrosa que pueda encuentrar cuando esté usando el respirator, (por ejemplo, espacios confinados, gases peligrosos le puedan matar):

18. Proporcione la información siguiente, si la sabe, para cada sustancia tóxica que va a estar expuesto cuando esté usando el respirador:
    Nombre de la primera substancia tóxica:_____
    Maximo nivel de exposición durante el turno de trabajo_____
    Tiempo de exposición del turno_____

    Nombre de la segunda substancia tóxica:_____
    Maximo nivel de exposición durante el turno de trabajo_____
    Tiempo de exposición del turno_____

    Nombre de la tercer substancia tóxica:_____
    Maximo nivel de exposición durante el turno de trabajo_____
    Tiempo de exposición del turno_____
    Nombre de otras sustancias tóxicas que va a estar expuesto mientras que usa su respirador:

19. Describa alguna responsabilidad especial que usted va a tener mientras que usa el respirator que puede afectar la seguridad o el bienestar de otros (por ejemplo, rescate, seguridad):

WAC 296-62-07257 Appendix D: Health Care Provider Respirator Recommendation Form--Non-mandatory This is a non-mandatory appendix to chapter 296-62 WAC, Part E.

This form is for the use of PLHCPs who are providing recommendations to employers regarding employee clearance for respirator use. Completion of this form satisfies the requirement for PLHCP's recommendations as detailed in WAC 296-62-07155. The following information is purposely limited in order to maintain employee confidentiality.

Employee Name: Employer Name: Address: Phone:	Health Care Professional Name: Address: Phone:

Type of Respirator This Individual is Medically Cleared to Use

Check all that apply.

Half -mask Full facepiece mask Helmet Hood Escape
Non -powered cartridge or canister Powered air -purifying cartridge respirator (PAPR)
Supplied -air or Air-line Disposable filtering facepiece (for example N-95)
Self contained breathing apparatus (SCBA): Demand or Pressure demand
Other: _____

Respirator Clearance

Under the conditions described in the supplemental information provided by the employer, this individual: (please check one)

_____ is medically cleared for use of the respirator(s) without limitations.
_____ is medically cleared for use of the respirator(s) with the following limitations:

_____

_____

_____ **is not** medically cleared for use of a respirator.

Workload Limitations

unrestricted heavy medium light

Follow-up Medical Evaluations

This individual will/will not (circle one) require additional follow-up medical evaluation(s). The recommended schedule for follow-up medical evaluations, if necessary, is as follows:

_____

_____

Employee Notification

I certify that the above named individual for whom this respirator clearance form is provided has received a copy of this recommendation.

Signature_____ Date _____
(Physician or other Licensed Health Care Professional)

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07257, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07260 Appendix E: Additional Information Regarding Respirator Selection--Non-Mandatory. This is a non-mandatory appendix to chapter 296-62 WAC, Part E, which includes WAC 296-62-07260 through 296-62-07295.
[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07260, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07261 How do you classify respiratory hazards? Respiratory hazards are classified into the following categories:

- Oxygen deficient;
- Physical properties (gas, vapor, biological aerosols, and particulate contaminants, which include dust, fog, fume, mist, smoke, and spray);
- Physiological effects on the body (for example, asphyxiant, carcinogenic, or toxic);
- Concentration of toxic material or radioactivity level;
- Established exposure limits; and
- Established immediately dangerous to life or health concentrations.

When selecting a respirator, you must determine which of the categories listed above apply to your workplace.
[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07261, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07263 What are oxygen deficient respiratory hazards?

(1) The oxygen content of normal air at sea-level conditions is 20.9%.

(2) Minimum legal requirements: An oxygen deficient atmosphere is one that has 19.5% or less oxygen by volume for respirable air at sea-level conditions.

(3) They commonly occur in confined or unventilated cellars, wells, mines, ship holds, tanks, burning buildings, and enclosures containing inert atmospheres.
[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07263, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07265 What needs to be considered when combinations of contaminants occur in the workplace? Combinations of contaminants (gas, vapor and particulate) may occur simultaneously in the atmosphere. Contaminants may be entirely different substances (dusts and gases from blasting) or the particulate and vapor forms of the same substance. Synergistic effects (joint action of two or more agents that results in an effect that is greater than the sum of their individual effects) may occur. Such effects may require extraordinary protective measures.
[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07265, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07267 What are the two major types of respirators? Respirators are classified into the following categories:

(1) Air-purifying respirators. The following types of air-purifying respirators are available:

- Particulate-removing;
- Gas- and vapor-removing; and
- Combination particulate- and either gas- or vapor-removing.

(2) Atmosphere-supplying respirators. The following types of atmosphere-supplying respirators are available:

- Supplied-air or airline;
- Combination supplied-air and air-purifying;
- Combination supplied-air with auxiliary self-contained air supply; and
- Self-contained breathing apparatus (SCBA).

[Statutory Authority: RCW 49.17.010., .040, .050. 99-10 (Order 98-10) § 296-62-07267, filed 05/04/99, effective 09/01/99.[

Air-Purifying Respirators (Aprs)

WAC 296-62-07269 What are air-purifying respirators (APRs)?

(1) Air-purifying respirators remove particles, vapors, gases, or a combination of these contaminants by passing contaminated air through a filter, cartridge, or canister. The breathing action of the wearer operates the nonpowered type of respirator. The powered type contains a blower (usually carried by the wearer), that pulls contaminated air through air-purifying media and then blows the purified air to the respirator user. The nonpowered type is equipped with a tight-fitting facepiece or without one (for example, mouthpiece/nose clamp types). The powered type is equipped with a tight-fitting facepiece, helmet, hood, or suit.

(2) Air-purifying respirators are classified into the following categories:

- Particulate-removing respirators;
- Vapor- and gas-removing respirators; and
- Combinations of the above.

(3) Air-purifying respirators (APRs) are available as nonpowered, tight-fitting respirators, powered-air-purifying respirators (PAPRs) and mouthpiece respirators.

(4) A variety of tight-fitting APR styles are available ranging from half facepiece to full facepiece masks, including PAPRs. PAPRs are also available in loose-fitting styles, featuring a hood or helmet instead of a tight-fitting facepiece. Gas masks are only available in the full-facepiece style and some are classified as PAPRs.

(5) Mouthpiece respirators do not provide for a mask-to-face seal and are designed to be worn with a mouth bit and nose clamp.

(6) The most commonly used type of APR is a nonpowered, tight-fitting half-mask. The facepieces available for this type of respirator may be composed of silicone or other elastomeric materials if a cartridge type respirator is needed. Noncartridge types are called filtering facepiece respirators and are primarily composed of fibrous materials.

(7) Disposable options are available for either elastomeric or filtering facepiece type half-masks. Some disposables may last for only a brief period of use while others are designed for prolonged use (designed to have nonreplaceable parts), sometimes referred to as low maintenance respirators. Disposables are generally less expensive than nondisposable type half-masks.

(8) In addition, special cartridge-type half facepiece models may also be available with features designed for specific work operations. For example, low profile type half-masks are available to be worn under welding hoods.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07269, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07271 What are the general limitations for air-purifying respirators (APRs)?

(1) Air-purifying respirators do not protect against oxygen-deficient atmospheres nor against skin irritation by, or absorption through the skin of, airborne contaminants.

(2) The maximum contaminant concentration against which an air-purifying respirator will protect is determined by the design and capacity of the cartridge, canister, or filter and the facepiece-to-face seal on the user. For gases and vapors, the maximum concentration for which the air-purifying element is designed is specified by the manufacturer or is listed on labels of cartridges and canisters.

(3) Nonpowered air-purifying respirators may not provide the assigned level of protection specified unless the facepiece is carefully fitted to the wearer's face to prevent leakage. The time period over which protection is provided is dependent on:

- Canister, cartridge, or filter capacity;
- Concentration of contaminant(s);
- Humidity levels in the ambient atmosphere; and
- The wearer's respiratory rate.

(4) The proper type of canister, cartridge, or filter must be selected for the particular atmosphere and conditions. Nonpowered air-purifying respirators may cause discomfort due to a noticeable resistance to inhalation. This problem is minimized with use of powered respirators. Respirator facepieces present special problems to individuals required to wear prescription lenses (spectacle kits are available from some manufacturers). These devices do have the advantage of being small, light, and simple in operation.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07271, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07273 What are particulate-removing respirators? Particulate-removing respirators are equipped with filter(s) to remove a single type of particulate matter (for example, dust) or a combination of two or more types of particulate matter (for example, dust and fume) from air. The filter may be a replaceable part or a permanent part of the respirator. It may also be a single-use or reusable type of filter.

(1) General limitations. Particulate-removing respirators provide protection against nonvolatile particles only. They do not protect against gases and vapors. They are not for use in atmospheres immediately dangerous to life or health (see WAC 296-62-07132).

(2) Full facepiece particulate respirators provide protection against eye irritation in addition to respiratory protection.

(3) Mouthpiece respirators must be used only for escape. Mouth breathing prevents detection of contaminant by odor. The nose clamp must be securely in place to prevent nasal breathing. A small, lightweight device that can be donned quickly.

(4) In environments with oil aerosols, you must not use “N” type particulate respirators.

(5) Combination particulate- and vapor- and gas-removing respirators are subject to the advantages and disadvantages of the component sections of the combination respirator as described above.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07273, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07275 What are vapor- and gas-removing respirators? Vapor- and gas-removing respirators are equipped with cartridge(s) or canister(s) to remove a single vapor or gas (for example, chlorine gas); a single class of vapors or gases (for example, organic vapors); or a combination of two or more classes or gases (for example, organic vapors, and acidic gases) from air.

(1) General limitations. Vapor and gas removing respirators do not provide protection against particulate contaminants. A rise in canister or cartridge temperature indicates that a gas or vapor is being removed from the inspired air. An uncomfortably high temperature indicates a high concentration of gas or vapor and requires immediate return to fresh air. Use must be avoided unless an ESLI or a change out schedule is available. They are not for use in atmospheres immediately dangerous to life or health.

(2) Full facepiece vapor- and gas-removing respirators provide protection against eye irritation in addition to respiratory protection.

(3) Mouthpiece respirators must be used only for escape. Mouth breathing prevents detection of contaminant by odor. The nose clamp must be securely in place to prevent nasal breathing. These are small lightweight devices that can be put on quickly.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07275, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07277 What are combination particulate- and vapor-and gas-removing respirators?

Combination particulate- and vapor-and gas-removing respirators are equipped with cartridge(s) or canister(s) to remove particulate matter, vapors and gases from air. The filter may be a permanent part or a replaceable part of a cartridge or canister.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07277, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07279 What types of filters, canisters and cartridges are available for air-purifying respirators (APRs)?

(1) Filters. Filters currently available for use against particulate contaminants are appropriate for solid particulates such as dusts or fumes, as well as being appropriate for nonvolatile, liquid particles such as sprays, mists and fogs.

(a) Cartridges or canister filters are available in addition to separate filter pads that can be added to some manufacturers' cartridges. They also may be formed into a filtering facepiece mask or as a wafer-like attachment. Regardless of how they are constructed, particulate filters are classified by physical limitations as "N," "R," and "P". Within each class, manufacturers may supply three different types of filters that reflect the efficiency rating (see below).

Class	Efficiency Rating		
N	95	99	100
R	95	99	100
P	95	99	100

(i) Filters that are classified as N-100, R-100, and P-100 are also referred to as HEPA filters. New particulate filters are more effective than older types of filters referred to as:

- Dust;
- Dust/mist; or
- Dust/fume/mist filters.

These older types of filters have highly variable efficiencies. They are no longer being manufactured and sold.

(ii) Any filter designated with "N" is appropriate for use in environments that do not contain oil. If you have oil aerosols, "R" or "P" designated filters are appropriate for use.

(b) Combination filters. Some vapor and gas cartridges and canisters have an added filter component for particulates. These are available as combination cartridges and will have a separate certification number listed on the respirator, packaging or in the operations manual for each type of contaminant.

(2) Canisters. Gas mask canisters are available for specific contaminants including ammonia, carbon monoxide, chlorine, phosphine and sulfur dioxide. Canisters are also available for general categories of chemical contaminants including acid gases, organic vapors, and pesticides. Canisters attachment options available are chin-, belt- or chest-mounted and a variety of canister sizes are available.

(3) Cartridges (nongas mask canisters). Cartridges are available for protection against specific contaminants and combinations of specific contaminants, including ammonia, chlorine, chlorine dioxide, formaldehyde, hydrogen chloride, hydrogen fluoride, hydrogen sulfide, mercury, methylamine, sulfur dioxide and vinyl chloride. Cartridges are also available for protection against general categories of chemical contaminants, including organic vapors, paints/lacquers/enamels and pesticides. Cartridge attachment options available include face-, chin-, belt- or helmet-mounted.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07279, filed 05/04/99, effective 09/01/99.]

Atmosphere-Supplying Respirators

WAC 296-62-07281 How do atmosphere-supplying respirators work?

(1) Atmosphere-supplying respirators supply a respirable atmosphere to the wearer.

(2) The two types of atmosphere-supplying respirators are:

- Self-contained breathing apparatus (SCBA); and
- Supplied-air respirators.

[Statutory Authority: RCW 439.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07281, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07283 What are the capabilities and limitations of atmosphere-supplying respirators? See WAC 296-62-07180 for the requirements on breathing gases used with atmosphere-supplying respirators.

(1) Capabilities. Atmosphere-supplying respirators provide protection against oxygen deficient and toxic atmospheres. The breathing atmosphere is independent of contaminated atmospheric conditions.

(2) General limitations. Except for some supplied-air suits, no protection is provided against skin irritation by materials such as ammonia and hydrogen chloride, or against absorption of materials such as hydrogen cyanide or organo-phosphate pesticides through the skin. Facepieces present special problems to individuals required to wear prescription lenses. Use of atmosphere-supplying respirators in atmospheres immediately dangerous to life or health is limited to specific devices under specified conditions (see WAC 296-62-07132).

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07283, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07285 What is a supplied-air respirator? A supplied-air (or air-line) respirator provides respirable air through a small-diameter hose from a compressor or compressed-air cylinder(s). The hose is attached to the wearer by a belt or other suitable means and can be detached rapidly in an emergency. A flow-control valve or orifice is provided to govern the rate of air flow to the wearer. Exhaled air passes to the ambient atmosphere through a valve(s) or opening(s) in the enclosure (facepiece, helmet, hood, or suit). Up to 300 feet (91 meters) of hose length is permissible. Hose supplied by the manufacturer and recommended operating pressures and hose lengths must be used.

Supplied-air respirators are classified in the following ways:

(1) Continuous-flow respirators, which are equipped with a facepiece, hood, helmet, or suit. At least 115 liters (four cubic feet) of air per minute to tight-fitting facepieces and 170 liters (six cubic feet) of air per minute to loose fitting helmets, hoods and suits are required. Air is supplied to a suit through a system of internal tubes to the head, trunk and extremities through valves located in appropriate parts of the suit.

(2) Demand type (negative pressure) respirators, which are only equipped with a facepiece. The demand valve permits flow of air only during inhalation.

(3) Pressure-demand type (positive pressure) respirators, which are only equipped with a facepiece. A positive pressure is maintained in the facepiece.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07285, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07287 What are the general capabilities and limitations of supplied-air respirators?

(1) Capabilities. The respirable air supply is not limited to the quantity the individual can carry, and the devices are lightweight and simple. The demand type produces a negative pressure in the facepiece on inhalation, whereas continuous-flow and pressure-demand types maintain a positive-pressure in the respirator-inlet covering and are less apt to permit inward leakage of contaminants. Supplied-air suits may protect against atmospheres that irritate the skin or that may be absorbed through the unbroken skin.

(2) Limitations. Employees are restricted in movement by the hose and must return to a respirable atmosphere by retracing their route of entry. The hose may be severed or pinched off. Supplied-air respirators provide no protection if the air supply fails. Some contaminants, such as tritium, may penetrate the material of an supplied-air suit and limit its effectiveness. Other contaminants, such as fluorine, may react chemically with the material of a supplied-air suit and damage it.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07287, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07289 What are combination supplied-air and air-purifying respirators? Combination supplied-air and air-purifying respirators provide the wearer with the option of using either of two different modes of operation:

(1) A supplied-air respirator with an auxiliary air-purifying attachment which provides protection in the event the air supply fails; or

(2) The advantages and disadvantages previously described for supplied-air and air-purifying respirators apply when these respirators are used in combination. The mode with the greater limitations (air-purifying mode) will generally determine the overall capabilities and limitations of the respirator, since the wearer may for some reason fail to change the mode of operation even though conditions require such a change.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07289, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07291 What are combination supplied-air respirators with auxiliary self-contained air supply? Some combination supplied-air respirators have an auxiliary self-contained air supply. To escape from a hazardous atmosphere in the event the primary air supply fails to operate, the wearer switches to the auxiliary self-contained air supply. Devices approved for both entry into and escape from dangerous atmospheres have a low-pressure warning alarm and contain at least a 5-minute self-contained air supply. The auxiliary self-contained air supply on this type of device allows the wearer to escape from a dangerous atmosphere. This device with auxiliary self-contained air supply is approved for escape and may be used for entry when it contains at least a 15-minute auxiliary self-contained air supply and not more than 20 percent of the rated self-contained air supply is used during entry (see WAC 296-62-07132).

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07291, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07293 What is a self-contained breathing apparatus respirator (SCBA)? SCBAs are respirators designed so that the supply of air, oxygen, or oxygen-generated material is carried by the wearer. They are normally equipped with a full facepiece, but may be equipped with a half-mask facepiece, helmet, hood or mouthpiece and nose clamp.

SCBAs are classified in the following ways:

(1) Closed-circuit SCBA (oxygen only, negative pressure or positive pressure). There are two types of closed-circuit SCBAs. They are:

(a) Compressed liquid oxygen respirators, which are equipped with a facepiece or mouthpiece and nose clamp. High-pressure oxygen from a gas cylinder passes through a high-pressure reducing valve and, in some designs, through a low-pressure admission valve to a breathing bag or container. Liquid oxygen is converted to low-pressure gaseous oxygen and delivered to the breathing bag. The wearer inhales from the bag through a corrugated tube connected to a mouthpiece or facepiece and a one-way check valve. Exhaled air passes through another check valve and tube into a container of carbon-dioxide removing chemical and reenters the breathing bag. Make-up oxygen enters the bag continuously or as the bag deflates sufficiently to actuate an admission valve. A pressure-relief system is provided, and a manual bypass and saliva trap may be provided depending upon the design.

(b) Oxygen-generating respirators, which are equipped with a facepiece or mouthpiece and nose clamp. Water vapor in the exhaled breath reacts with the chemical in the canister to release oxygen to the breathing bag. The wearer inhales from the bag through a corrugated tube and one-way check valve at the facepiece. Exhaled air passes through a second check valve/breathing tube assembly into the canister. The oxygen-release rate is governed by the volume of exhaled air. Carbon dioxide in the exhaled breath is removed by the canister fill.

(2) Open-circuit (SCBA) (compressed air, compressed oxygen, liquid air, liquid oxygen). A bypass system is provided in case of regulator failure except on escape-type units. There are two types of open-circuit SCBAs. They are:

(a) Demand-type respirators, which are equipped with a facepiece or mouthpiece and nose clamp. The demand valve permits oxygen or air flow only during inhalation. Exhaled breath passes to ambient atmosphere through a valve(s) in the facepiece.

(b) Pressure-demand type respirators, which are equipped with a facepiece only. Positive pressure is maintained in the facepiece. The apparatus may have provision for the wearer to select the demand or pressure-demand mode of operation, in which case only the demand mode must be used when putting on or removing the apparatus.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07293, filed 05/04/99, effective 09/01/99.]

WAC 296-62-07295 What are the limitations for self-contained breathing apparatus respirators (SCBA)?

(1) The period over which the SCBAs will provide protection is limited by the amount of air or oxygen in the apparatus, the ambient atmospheric pressure (service life of open-circuit devices is cut in half by a doubling of the atmospheric pressure), and the type of work being performed. Some SCBA devices have a short service life (less than 15 minutes) and are suitable only for escape (self-rescue) from an irreparable atmosphere. Chief limitations of SCBA devices are their weight, bulk, limited service life, and the training requirements for their maintenance and safe use.

(2) What are the limitations for closed-circuit SCBAs?

The closed-circuit operation conserves oxygen and permits longer service life at reduced weight. The negative-pressure type produces a negative pressure in the respiratory-inlet covering during inhalation, and this may permit inward leakage of contaminants; the positive-pressure type always maintains a positive pressure in the respiratory-inlet covering and is less apt to permit inward leakage of contaminants.

(3) What are the limitations for open circuit SCBAs?

The demand type produces a negative pressure in the respiratory-inlet covering during inhalation, whereas the pressure-demand type maintains a positive pressure in the respiratory-inlet covering during inhalation and is less apt to permit inward leakage of contaminants.

[Statutory Authority: RCW 49.17.010, .040, .050. 99-10 (Order 98-10) § 296-62-07295, filed 05/04/99, effective 09/01/99.]